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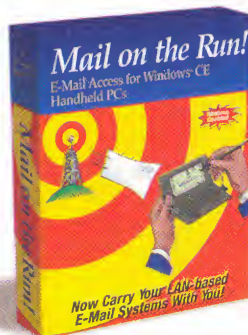
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Publisher's Message

Hal Goldstein

It seems you can have it both ways! Windows CE devices are getting a little smaller and simpler – and they're getting a little bigger and more full featured.

Editor Rich Hall takes a first look at the smaller, simpler Palm PC, from a handheld PC user's perspective. Then Dave Wecker, Microsoft's lead Windows CE engineer, gives a frank, behind-the-scenes discussion about the development and future of the Palm PC.

Rich then takes a look at the Sharp Mobilon H/PC. It's a little larger than the original H/PCs, and its Digital Camera Card adds the ability to take and store high-resolution digital photos with the Mobilon, wherever you are.

The Palm PC has no keyboard and depends on pen input. Many Handheld PC users like having the functionality of a keyboard but would like the option of handwriting input. Dave Shier reviews three programs that add handwriting recognition capability to the H/PC. Following Dave's review, we take a look at stylus/pen combinations. These devices look like pens, but come with a ballpoint and stylus. For many, the stylus that came with the H/PC is sufficient. But for those who want something a little nicer, take a look at a variety these fine looking devices.

Next, Andrew Seybold and John Jerney give us a glimpse the future. Andrew speaks of the present and future state of wireless communications and Windows CE devices. John tells us why he thinks Microsoft is interested in General Magic technology. In addition to all this, there is the usual assortment of tips, how-tos, profiles, new product announcements, web sites to visit, plus an overview of the different Windows CE devices.

We really would like to know how we're doing. Do you like to see reviews of new Windows CE devices? Want more tips? Like the interviews? Want more profiles? Would you like to contribute? Please write Rich Hall or me at editor@thaddeus.com. And check out www.thaddeus.com for the latest in Windows CE freeware and shareware as well as links to web sites of all vendors of Windows CE-based products.

Hal Goldstein



May/June 1998

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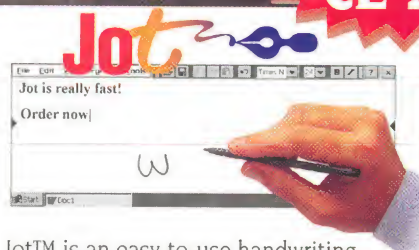
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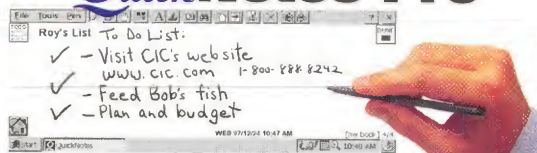
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A Sharp Handheld PC *and a Sharp Picture*

Review of the Sharp Mobilon 4500 and PC Card Digital Camera

By Rich Hall

Managing Editor, Handheld PC Magazine

I've been wanting to take an extended look at the Sharp Mobilon 4500 ever since I saw it at COMDEX last November. It was one of two color-screen H/PCs announced at that show and the Sharp booth was crowded with people wanting to take a look at it. But the Mobilon's color screen was upstaged by the Sharp Digital Camera Card; a small PC card device that slips into the Mobilon's card slot and turns the 4500 into a portable digital camera.

It arrived today, about an hour ago. I dropped everything like a kid at Christmas, tore open the box, inserted the Digital Camera Card into the Mobilon and turned it on. I got the usual Windows CE warning about a PC Card draining the batteries. I ignored the warning, double tapped the Camera icon on the Windows CE desktop, and immediately got a message that the main battery was too low to run the camera.

The Mobilon 4500 uses a NiMH

rechargeable battery pack that generally doesn't come pre-charged. In fact, it was surprising that it was charged at all. I plugged the Mobilon into its AC adapter and tapped the Camera icon again. Presto! I got a black screen. I took a close look at the camera and noticed THE LENS COVER, which I popped off. (The lens cover is tethered to the camera card with a short cord, so you don't lose it.) I tapped on the Camera icon again and — presto again! I took a digital picture.

Shown in Screen 1 is the first digital photo I took from the Mobilon — a piece of paper taped to the side of my desktop PC. The Mobilon with Digital Camera Card are resting on the corner of my desk and the black object in the lower right corner of the screen is the Digital Camera's lens cover, which is attached to the camera by a short cord so you don't lose it. It has a tendency to get in the way of the lens if you set the

Mobilon down on a flat surface to take a picture. I have decent lighting coming through a window and made no attempt to adjust anything on the camera. This is the actual



Screen 1: The first digital photo I took from the Mobilon is a piece of paper taped to the side of my desktop PC. The blurred black object in the lower right corner is the lens cover, which I left laying on the table, in front of the lens.



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Sharp Mobilon

"Fine" resolution .JPG file, transferred to my desktop computer and dropped into the article by our graphic designer. I asked him not to touch up this photo.

A fresh start!

I was not the first editor to use this particular Mobilon. There were additional names in the Contact list and the software for the camera had been already installed. The Digital Camera Card is sold as an option, so I wanted to see how easy it was to set up. After I had satisfied the urge to take a couple of pictures, I pulled the main and backup batteries from the Mobilon and started over with a clean machine.

I reinserted the batteries, turned on the Mobilon, and went through the Windows CE initialization routine (i.e., calibrating the touch screen, setting time and date, etc.). The desktop screen came up, without the Camera icon. Next I connected the Mobilon to my desktop PC using the connectivity cable that came with the H/PC. Windows CE 2.0 devices communicate with desktop and Notebook PCs using a program called Windows CE Services. This program comes on a CD ROM with all H/PCs and Palm PCs, and installs on Windows 95 or Windows NT PCs. I had already installed a copy of Windows CE Services on my desktop PC (when I was reviewing another H/PC). As soon as I connected the cable from the Mobilon to the desktop PC, a screen appeared on the Mobilon telling me it was communicating with the desktop. Windows CE Services popped up on my desktop and asked me if I wanted to establish a new partnership. I tapped OK and the two devices synchronized.

Installing software for the Digital Camera Card

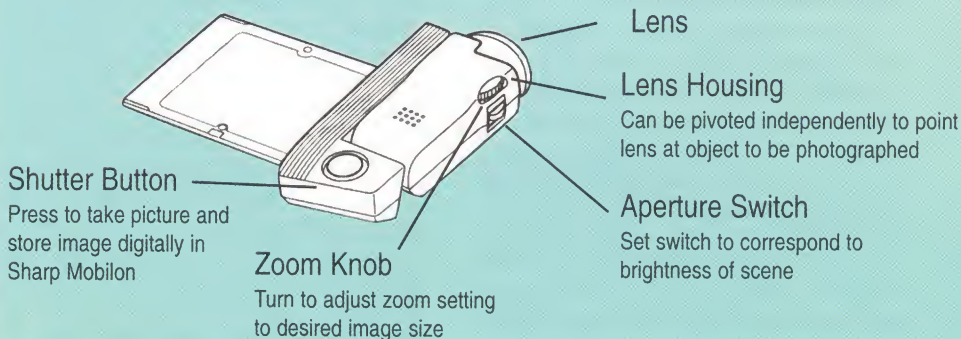
The manual that came with the Digital Camera Card explained that I had to connect the Mobilon to my PC, insert the floppy disk



Screen 2: This is the main screen of the Camera application, as it appears on the Sharp Mobilon 4500. The center of the screen shows the image you'll take when you press the button on the Digital Camera Card. The actual .JPG file looks much better than the image as it is displayed on the Mobilon.

A Closer Look at the Sharp Mobilon's

Camera Card



that came with the digital camera, and run setup. (You must first install Windows CE Services). I did so and the setup worked smoothly. In about 60 seconds two new icons were on the Mobilon's desktop: Camera and Album. Camera is the application you use to take pictures. Album is used to look at them afterwards.

The camera manual warns that the Mobilon's rechargeable battery pack should be fully charged before slipping the camera card in the slot. It further warns not to use the card in a Mobilon running off of regular alkaline batteries. For my first test of the Camera Card I left the Mobilon connected to its AC power adapter.

I think you're going to like this picture.

I slipped the card in the slot and tapped on the Camera icon on the Mobilon's desktop and got the black screen (forgot the lens cover again), popped off the lens cover and was up and running. I took a few pictures

and a long look at the camera application. Screen 2 shows how the open Camera application appears on the Mobilon. The picture shown in the center of the screen is of the box the Mobilon came in.

The left side of the main Camera application screen lets you set the Image Size (VGA 640x120, 640x240, 1/4VGA 320x240, and 1/16VGA 160x120); the Image File Format (Full Color JPEG Fine and JPEG Normal) and whether or not you want the photo to appear in an album. To take the largest number of photos, you set the Image Size and Image File Format to the lowest settings and do not have the photo appear in the album. The right side of the Camera application screen lets you zoom or flip the image, set the contrast, and divide the screen into 4 or 16 images (see screen 3).

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A walk and a few photos

After learning the basics of the Camera application, I decided to disconnect the Mobilon from its AC adapter and walk around the office taking embarrassing pictures of people. I got a "low power" message sooner than I expected. This surprised me because the folks at Sharp told me that I could take up to 300 photos on a fully charged battery. I noticed that if I let the Mobilon sit for about 10 minutes with the power off, I could turn it back on and take some more photos without recharging. I experimented with different settings, called Sharp technical support, and came up with four important tips to maximize the number of photos you can take on a fully charged battery.

1. Discharge periodically—The Mobilon 4500 comes with a NiMH rechargeable battery pack. According to Sharp, if you partially charge the battery over and over again, it can lose capacity. It has to be periodically discharged completely to maintain the ability to hold a full charge. To do this, you disconnect the Mobilon for the AC adapter, open the Control Panel and activate the Discharge Utility, unique to the Sharp H/PC.

2. Change Image Size and File Format—The larger and higher resolution the photo is, the fewer you can take and the quicker you drain the battery. I was able to take the most photos when I set the camera's Image Size to "1/16VGA (160x120)" and the Image File Format to "Full Color (JPEG Normal)". Another thing that increases the number of photos you can take is if you uncheck the box labeled "Add Image to Album." If you have this box checked, Camera actually captures two images of the same photo. The second is a thumbnail-sized picture for display when you use the Album application.

3. Install Sharp backlighting utility. Sharp has included a special utility for the Mobilon 4500 that manages the backlighting of the unit in a way that is easier on the battery. This utility is found on the Sharp CD-ROM that comes with the Mobilon. It installs easily and is invisible to the user.

4. Turn off the Mobilon and let it sit. I don't know why this matters, but it seems to. After I got the low-battery message I turned off the Mobilon, pulled the Digital Camera Card out and let everything sit for 10 minutes. I did not connect the Mobilon to its power adapter. When I put the card back in I could take more pictures.

Following this advice, I was able to get 259 photos on a fully-charged battery. I probably could have gotten a few more photos

buy turning the Mobilon off and letting it sit some more. I did satisfied myself that Sharps estimate of 300 photos on a fully charged battery was in the ballpark. Note that I got the 234 photos by setting the Mobilon with camera down, aiming it at an object and clicking the shutter every two seconds, until I got the low battery warning. I didn't move it around to find another shot, or change the focus, or any of the normal stuff you'd do when you take a picture. I suspect that the actual number of photos you would get is far less than 300, but certainly over 100. That seems sufficient for most uses. That 300 photo estimate was under ideal conditions.

Album is another application that installs on the Mobilon when you run the Digital Camera Card installation disk. Album lets you view a thumbnail album of the photos you've taken (Screen 4). Tap on the desired thumbnail and the full picture displays. These thumbnails take up some memory, but unless you are strapped for storage space on your Mobilon, I don't think it will matter.

Windows CE looks nice on a color screen

A few words and Windows CE for the people who buy this magazine of the newsstand and aren't familiar with the handheld PCs. Windows CE is the operating system made by Microsoft for handheld PCs (and now Palm PCs and Auto PCs). Handhelds like the Sharp Mobilon come with the latest version of the operating system (Windows CE 2.0) built in. In addition, H/PCs like the Mobilon come with standard built-in applications, including a word processor (Pocket Word), a spreadsheet program (Pocket Excel), a presentation program (Pocket PowerPoint), an information manager (Pocket Outlook) that contains a Contacts list, a Calendar, a Tasks list, and an email Inbox. The H/PCs also come with an H/PC-sized Internet browser (Pocket Internet Explorer), a calculator, clock, communications program and a number of useful utilities.

I won't spend much time reviewing Windows CE 2.0 or its applications, other than to mention that the various applications look nice on the Mobilon's color screen. They open and close relatively fast on the 75 MHz Sharp Mobilon H/PC. However, I do want to mention some things about the other applications that came with the Sharp. One is Voice Record.

Voice Record

All of the Windows CE 2.0 H/PCs come



Screen 3: Camera's Division Mode lets you create a 4- or 16-panel image. Shown here is a 16-panel image of the cover of the March/April issue. I set the camera up to take 16 images of the same picture, but you can create something like this with 4 or 16 different images.



Screen 4: The album application lets you view thumbnail views of the photos you've taken with the Digital Camera Card. Tap on the desired thumbnail to see a full view of the photo.



Screen 5: The Mobilon's Voice Record display lists in the white box in the left part of the screen the messages you've recorded. You can tap on a message to play it back. Use the "sliding" indicators on the right to set the record or playback volume level.



Screen 6 shows an Image Editor graphic created by my 9-year-old daughter Ella on Valentine's Day. Image Editor lets you create graphics, including circles, squares, straight lines, freehand drawing, and text. You can change the colors of these graphical objects and save the files in .JPG or .BMP format.

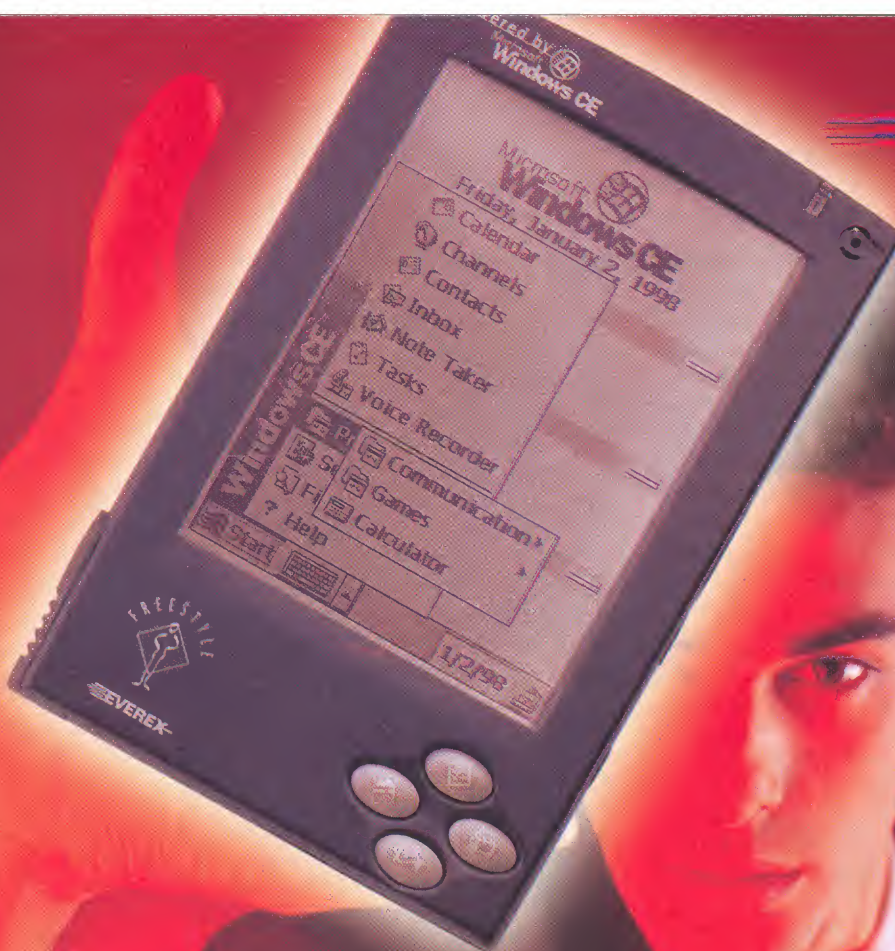
with voice record capability. The Mobilon's Voice Record display (Screen 5) lets you record messages, play recorded messages, and set record and playback volume levels. You can access Voice Record with the Mobilon's case closed by simply pressing and holding down the record button on the



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front of the case. This makes it easy to record a voice memo on the go (and play it back later at the office).

Voice Record's sliding volume control (Screen 5) does not effect the Control Panel volume setting. The record quality is fine for messages, but I suggest that with this or any H/PC, you speak directly into the microphone (left front edge of the Mobilon, by the Ctrl key) when you record the message, especially if you are in a place with a lot of noise. When you play a message back, turn the Mobilon over to expose the speaker. A five-second message takes up about 60 Kb of storage space.

Image Editor

The Mobilon comes with a built-in Image Editor. This little utility lets you create simple graphics and edit image files or the photos. I ignored the Image Editor at first. Then I let my 9-year-old daughter look at the Mobilon for an hour. I asked her what her favorite feature was. She tapped on the Image Editor to show me a little drawing she'd done (Screen 6).

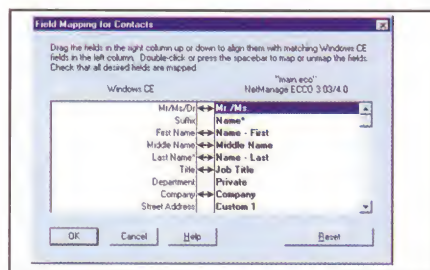
You can create simple graphics that include circles, rectangles, straight lines, free-hand lines, and text. You can also use a palette of "stamps" to add icon-sized objects to the graphics you create or edit. In addition, you can add "refinements" to the photos you take with the Digital Camera Card (Screen 7).



Screen 7 shows how Image Editor can be used to "enhance" photos you take with the Camera. The picture is of Peder Sweeney, our Marketing Director. I used Image Editor's drawing and text features to add the bubble where we can see his thoughts.



Screen 8: IntelliMigrate's main screen as it appears on the desktop PC. IntelliMigrate lets you translate and integrate Calendar and Contact information from a number of different palmtops, PDAs and organizers. It is a one-way process, assuming that you are switching over from the old PDA to the H/PC.



Screen 9: IntelliMigrate's Field Mapping screen lets you "re-map" data from one field on the PDA to a different field on the H/PC.

Some free software on the CD-ROM

A couple of nice programs can be found on a CD-ROM that comes with the Mobilon. Actually there are two CD-ROMs. One is from Microsoft and has Windows CE Services on it. The other one is from SHARP, and has two programs on it: bFAX Express and IntelliMigrate.

bFAX Express is a send-only fax utility from bsquare technologies (www.bsquare.com). bFAX lets you create and send faxes from the Mobilon (or any H/PC). You can adjust fonts, select fax numbers, automati-

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cally add a cover page, attach documents to the fax, and preview the fax before you send it. I did not have a PC Card modem to test this utility, but it looks very simple and straightforward.

The program I was most interested in was IntelliMigrate from Puma Technologies (www.pumatech.com). IntelliMigrate translates and integrates appointment book and phone book data from a number of PDAs to the Calendar and Contacts applications on a Windows CE device. Notice that I did not use the word "synchronize." IntelliMigrate is meant to be a one-way solution for people who are changing over from another PDA to the Sharp Mobilon (or any H/PC). IntelliMigrate "migrates" appointment book and address book data from several types of palmtops or PDAs, including Sharp organizers, the Hewlett-Packard 100LX and 200LX Palmtop PCs and OmniGo 100, and Casio organizers (Screen 8). I still have a 200LX (an older, DOS-based palmtop computer) and I decided to test IntelliMigrate's capabilities.

IntelliMigrate installs on, and runs from a desktop PC to which you connect the Mobilon and the other PDA serial ports. Since I only had one useable serial port (COM 1), I chose an IntelliMigrate option whereby I connected the 200LX up to COM 1; ran IntelliMigrate; disconnected the 200LX and connected the Mobilon in its place; and finished the process. I've over simplified the description a little, but the process is pretty straightforward. It took a few minutes, and then notified me that it had been completely successful. I'm a trusting soul, but I went ahead and checked the Mobilon's Contact application. Everything was there, in the proper place.

IntelliMigrate lets you "re-map" data fields from one application to another. For example, let's say the PDA device you have been using stores a person's title in a field called, "Job Title." The same information is stored on the H/PC in a field called "Title." You can re-map that data from Job Title on one device to Title on the H/PC (Screen 9).

Sleek, gray, and slips in your pocket

Normally, I start a review with a look at the hardware. This review had a mind of its own — I went where the fun was. The Mobilon 4500 without the Camera Card is a little smaller and lighter than the other color H/PC I've tested (the HP 620LX). The Mobilon slips in and out of my inside coat pocket easily (but I still know it's there). Traveling to work and back, I wouldn't

think twice about carrying it this way. If I were on the road for long stretches, I'd probably keep it in my briefcase.

I liked the Mobilon's keyboard. The keys travel a short distance and don't require much pressure. Touch typing on any H/PC requires that you modify your technique a little (using three or four fingers per hand instead of five). But if you're a touch typist, once you get used to the size difference, you'll be able to type pretty fast on this keyboard.

The color screen is a big improvement over monochrome screens on earlier H/PCs (and some of the new ones). It's not quite as bright as the screen on the 620LX, but that's a matter of small degrees. If you want, you can compare the two screens at a computer super store. I don't believe the screens will be the deciding factor.

I didn't run the battery dry to see how long it would last (without the Camera Card). I did take it home a couple of weekends and used it for notes and to play a few of the games from the Microsoft Entertainment Pack. I had no problem with the batteries running low. My advice on this is the same for any H/PC (and especially the color screen models). Connect your H/PC to its AC adapter whenever you sit down at your desk, and keep an extra AC adapter at home. If you're on the road a lot, take your AC adapter along. If circumstances prevent you for using the AC adapter for long periods of time (long international flights, etc.) then keep an extra charged battery pack in your pocket.

Don't forget the modem! The Mobilon 4500 comes with a built-in 33.6 Kbps modem. This will be a popular feature for mobile professionals, letting them check their email, send reports back home, and surf the net with Pocket Internet Explorer. The RJ-11 end of a standard phone cable slips into a receptacle in the upper left corner of the keyboard by the Esc key. A small hinged cover about half the size of a small postage stamp protects it. It lifts up about 30 degrees and you slip a standard RJ-11 phone connector in the slot. I had no problem slipping a phone connector in the slot and the arrangement is remarkably sturdy. But be careful with this and don't force anything.

Sharp told me that they expect this combination to be popular with people in the real-estate industry, insurance adjusters, and other professionals who have to photographically document things. The Digital Camera Card is not that much more expensive than a low-to-mid priced digital camera, and the Mobilon 4500 provides the user with a small, very usable "PC Companion" to take care of business while away from the office. It's a good combination and I think Sharp Mobilon and Digital Camera Card will be successful. ■

The Sharp Mobilon 4500 color screen H/PC retails for \$999. The Digital Camera Card retails for \$399. For more information contact your Sharp dealer or Sharp Electronics Corporation; Phone (USA): 800-BE-SHARP; Fax on demand: 630-397-8601. More information about Sharp products and a list of Mobilon dealers is available on the Sharp website: www.sharp-usa.com.

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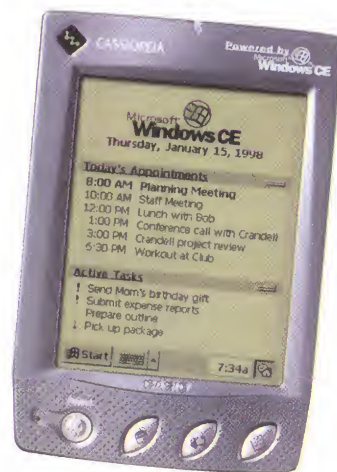
PC

a "palms-on" look

at
the
**HOT
NEW**

**Everex
Freestyle!**

**Cassiopeia
E-10!**



By the time you read this, the first of the Palm PCs will have hit the market. Everex and Casio should already be shipping, with Samsung, LG, Palmax and Philips to follow shortly.

...by
*Rich
Hall*

Both Everex and Casio were kind enough to loan me pre-production versions of their Palm PCs for a few days of testing. The Casio E-10 and Everex Freestyle I saw were beta units, so this won't be a detailed review of hardware. We'll do follow-up reviews of the Palm PCs they ship to distributors. This review focuses on Windows CE and the built-in applications as they appear on the Palm PC. Since most of our readers are familiar with Windows CE handheld PCs, I'll use the H/PC to compare features.

Not an H/PC

Windows CE seems to be growing in two directions: larger and smaller. H/PCs are getting bigger and more full-featured. It's getting easier to see their screens and type on their keyboards. You can still carry them around in your pocket, but you feel the weight. You can number-crunch in Excel, write memos in Word, and use a growing number of third-party applications to do almost whatever you want to do on the H/PC.

The first thing you notice about the Palm PC is that it's a lot smaller than the H/PC and doesn't have a keyboard. It's smaller, quicker, and simpler than the H/PC. Whip it out, check your appointments, look up a phone number or make a quick note, and slip it back in your pocket. Everything you enter into the Palm PC, you enter with a stylus, via handwriting recognition or a "soft keyboard" (more on this later). You can enter data into the Palm PC, but you won't be doing a lot of that. Instead, you'll do that on your desktop or H/PC and download it to the Palm PC. Third-party applications that come along for the Palm PC better capitalize on its quick, fast nature.

Just a little about the hardware

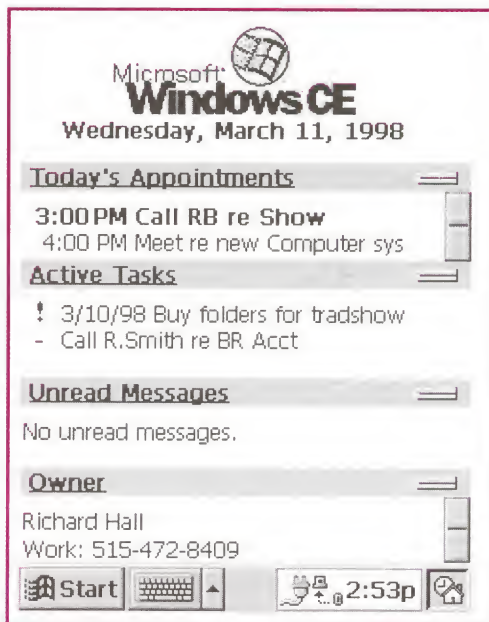
I can't resist making a few comments about things that probably won't change. Both the Casio E-10 and Everex Freestyle I saw were about 3" x 5" and a little under 1" thick. The specifications sheet says the Casio is 5.5 oz, the Everex 5.3 oz. They are both very lightweight. Either one easily slips in your shirt or coat pocket. You can easily hold a Palm PC in one hand and a stylus in the other.

Both have hardware buttons on the front

below the screen to let you quickly access the most important applications. If you don't like the applications associated with these buttons, you can change that. In addition, there are thumb and finger buttons (rocker arms, actually) on the sides of the units to make it easier to navigate through an application once it's open. For example, once you've opened Contacts, you can use these navigation buttons to scroll through the list and click on a name to see the complete contact information.

The Casio E-10 had its navigation buttons on the upper left side of the unit. A right-handed person would probably hold the Casio in the left hand and navigate with the thumb of their left hand. The Everex Freestyle's navigation buttons were on the right side of the unit and would be operated by the fingers of the left hand. A left-handed person holding either unit in the right hand can use these buttons, but not quite as easily as a right-handed person can.

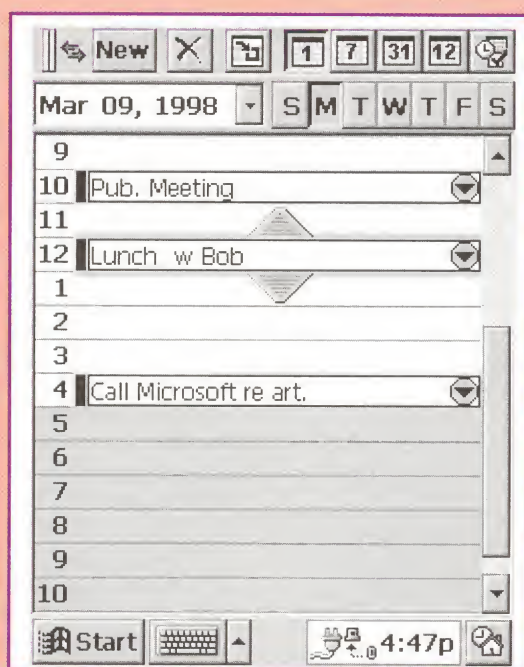
Both have an IrDA infrared port, serial port, and CompactFlash slot; both are backlit; both are powered by two AAA batteries and will come



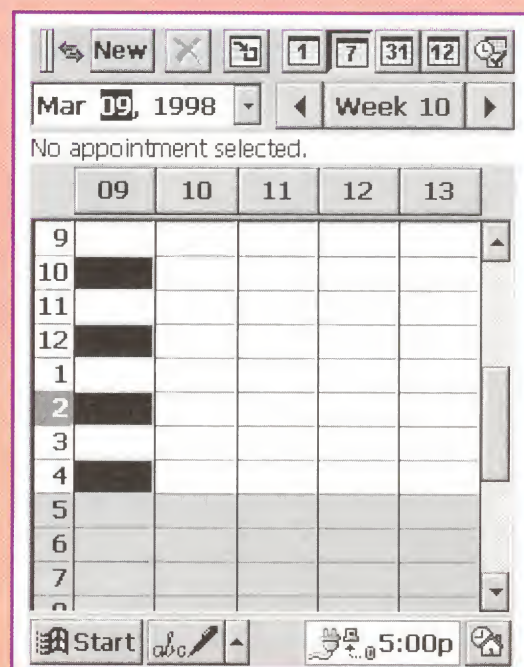
Screen 1: The Active Desktop can display owner information as well as a summary of daily appointments, active tasks, Inbox messages, and the current date.

5 LOOKS at *Calendar* on the PALM PC

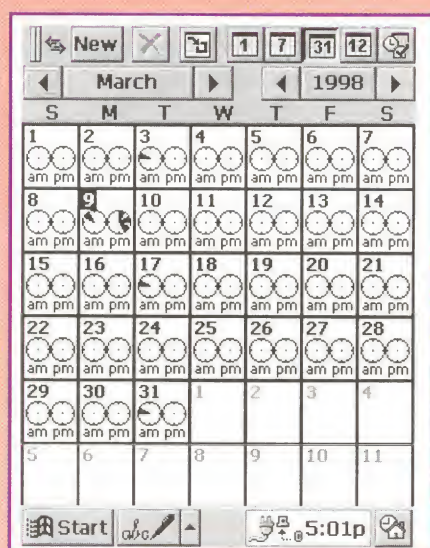
January
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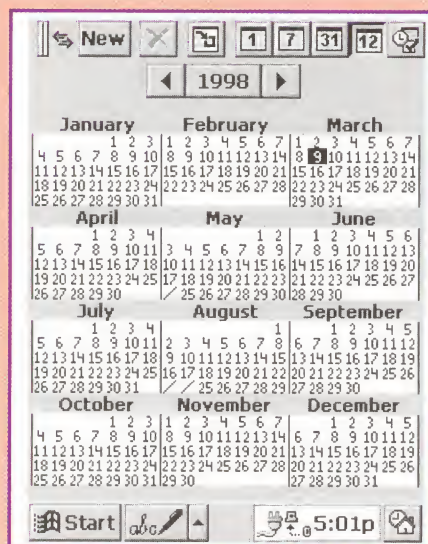
Screen 3: Calendar's Daily view looks similar to the H/PC, but without the month calendar.



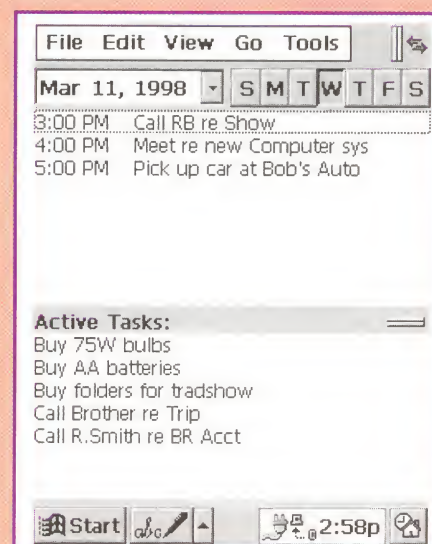
Screen 4: Calendar's Weekly view shows time slots with appointments blocked out in black. You can change the display to show half-hour time slots and 7-day weeks.



Screen 5: Calendar's unique Monthly view shows two 12-hour clock faces for each day in the month. Little black slices on the clock faces of a particular day indicate appointments.



Screen 6: Calendar's 12-month view displays a calendar of the year. Appointments are not visible on this display, but the current date is highlighted by a little black box (March 9 on this example).



Screen 7: Calendar's Agenda view displays a split-screen view of the day's appointments and active tasks.

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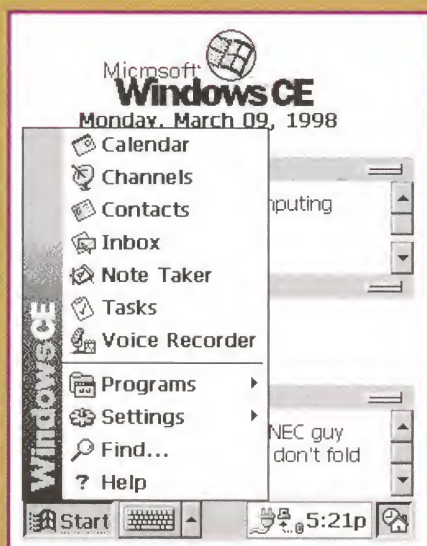
The other day I'm making like a big-game fisherman. I waded into the water and waited for a wiggle, when all of a sudden my palmtop goes off. The message ended with, "The Anderson deal will fall through unless you get involved ASAP." So all that morning, thanks to **ZAP-IT's Wireless InBox** and some detailed communications through my palmtop — I'm reeling in the business deal of my career! And believe it or not, I finally get a bite from my wily underwater prey. By noon, my day was complete; I landed the big fish I was really after! And I have this picture to remind me why I'll never go fishing again!

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Screen 2: Applications can be started by pressing the Start button icon and selecting them from a pop-up list.

with connectivity cradles, cable and AC adapter. Both have a built-in microphone and speaker.

A quick look at the built-in software

Many of the built-in applications are similar to those on the H/PC, but some are brand new, or have new features. The first thing you see when you turn on your Palm PC is the owner information display. There's a similar screen on the H/PC. Both tell the world who the H/PC or Palm PC belongs to. If you lose your PC Companion, this screen will help the finder find you. You can deactivate this screen, but don't.

Another screen that will pop-up is the "Active Desktop." There is no equivalent to this screen on the H/PC. From the Display Properties option in the main Setup menu this screen can be configured to display owner information, a summary of your appointments and active tasks, Inbox messages and the date. (see Screen 1, page 15). You can access this screen anytime by tapping the clock/house icon located in the very bottom right of the screen.

When you're ready to access an application, you can press the appropriate hardware buttons on the front of the Palm PC, or tap on the Start button icon and select the application from the pop-up menu (Screen 2).

Here's a quick look at some of the appli-

cations on the Palm PC.

Calendar

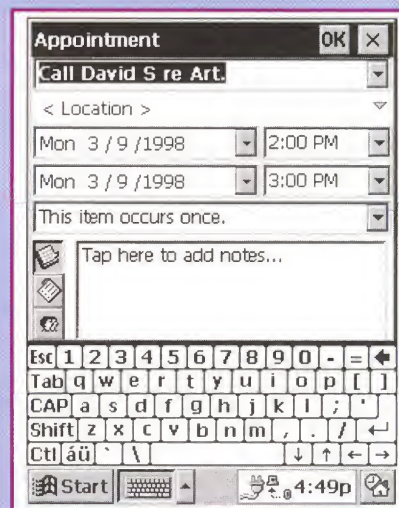
The orientation of the display is changed from horizontal to vertical, but otherwise the application looks very similar to Calendar on the H/PC. The Daily view of Calendar on the Palm PC does not have enough room to display the little month page you see on the H/PC (Screen 3, page 16). But you can tap icons at the top for weekly and monthly views of your calendar. You can also pop up a 12-month calendar and "Agenda" view of the day's appointments and active tasks (see Screens 4 to 7, page 16).

Handwriting recognition and "soft keyboard"

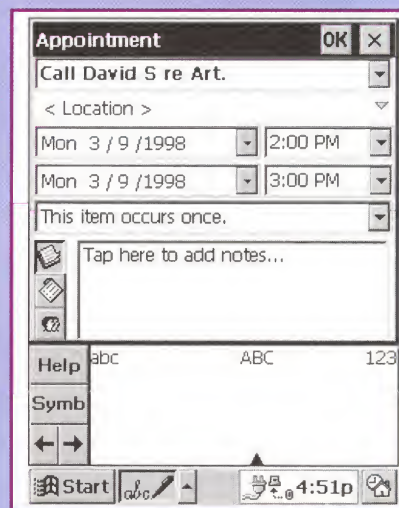
There are two ways to enter data on the Palm PC. One is through a "soft keyboard" displayed on the bottom third of the display (Screen 8). This is a picture of a QWERTY keyboard. You tap on the desired key to enter the character. The other way to enter data is by using the built-in handwriting recognition capability. On the two versions I tested, this was provided by a version of CIC's Jot character recognition program, built into the Palm PC ROM. When this feature is selected, a pen-entry area is displayed on the bottom third of the display (Screen 9).

I used both methods to enter an appointment, worded "Check email for article." The soft keyboard is faster at first, but I believe that is because I was inexperienced with the character recognition mode. For example, until I got the hang of it, every time I'd write an "f" it would come out a "t" or "g." CIC has thoughtfully provided a help feature that shows you the different ways you can draw a character (Screen 10). You'll be able to easily figure out most of the letters and numbers. I found the punctuation marks a little more difficult. Entering data using Jot gets easier and faster as you gain experience. If you prefer to train the Palm PC to recognize your way of writing, you might try smART Writer from Advanced Recognition Technologies (www.artcomp.com). A version of smART Writer is available for the Palm PC and may come bundled on CD-ROM with some models. (See page 38 for a separate review of Jot, smART Writer and CalliGrapher; three handwriting recognition programs for the H/PC.

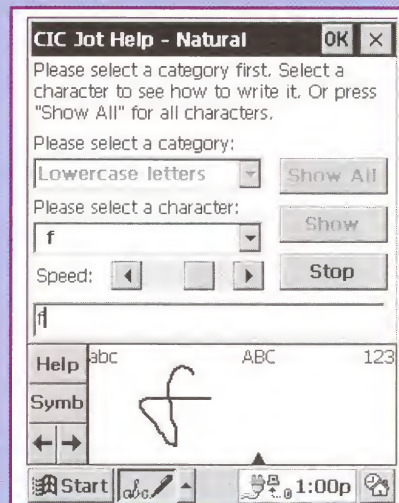
One thing that speeds things up tremendously is the Word Completion feature built into the Palm PC (from a company named Tegic). As you enter characters (via Jot or



Screen 8: Calendar's new appointment screen, with the "soft keyboard" displayed at the bottom of the screen.



Screen 9: Calendar's new appointment screen, with the Jot handwriting recognition screen at the bottom of the display.

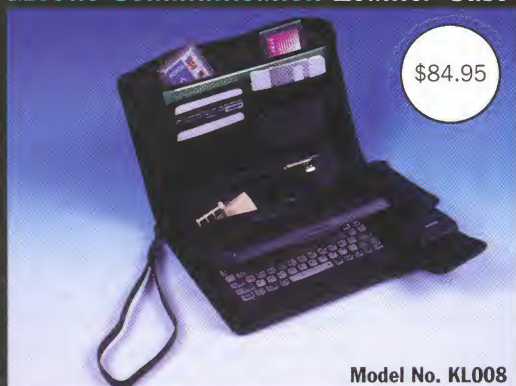


Screen 10: You can access Jot's Help screen and have it show you how to draw a character or symbol.

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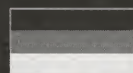
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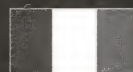
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the soft keyboard) the Palm PC tries to figure out what you're entering and pops up a list of possible words. If the word you're entering is in the list, all you have to do is tap on the word and the Palm PC completes it for you. This is a simple little feature that is worth its weight in gold! It speeds up text entry considerably and I would like to see Microsoft incorporate it into their H/PCs as well.

Like in the H/PC, you can attach notes to your appointments. Unlike the H/PC, these notes can include handwritten comments or diagrams.

Contacts

The main Contacts screen is similar on both the Palm PC and the H/PC. However, there is a nice improvement on the Palm PC. Highlight one of the names in the list and a summary of the information (name, company name, work phone and fax) appears at the top of the display (see screen 11). This makes it quicker and easier to find phone numbers, and is another feature that would enhance the H/PC.

I discovered something using Contacts that is a general principle for the Palm PC. Don't use the Palm PC to enter a lot of data. Entering a few words for an appointment or note is no big deal, but I tried entering complete contact information for an individual and found it tedious. Based on my present skill level, I think I'd just take someone's business card, enter that contact information in Outlook on my desktop PC and synchronize with my Palm PC. Of course, if the other person has a Palm PC, H/PC, or Auto PC, you can simply "squirt" contact information back and forth using the infrared ports.

Note Taker

There's nothing quite like this one on the H/PC. It's a little memo pad that lets you jot down quick notes, make simple drawings, and store them as separate notes. This is one of the features I've wanted for years – to be able to draw a map to someone's house, or sketch out a floor plan. Note Taker lets you enter text as handwriting (i.e., "ink") or in character mode using Jot or the soft keyboard. You can delete or move individual words, sentences, or drawings, and sort your notes in different folders (see screens 12, 13, and 14).

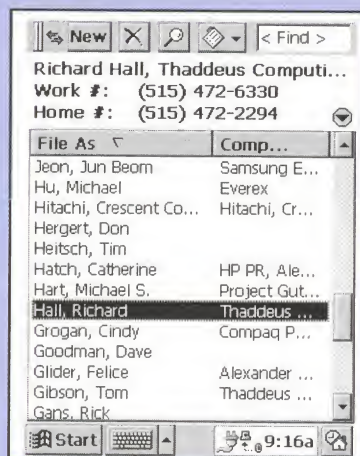
Tasks

The items on the task screens have been moved around to fit the vertical orientation. One nice improvement is that a drop-down menu has been added to the task description

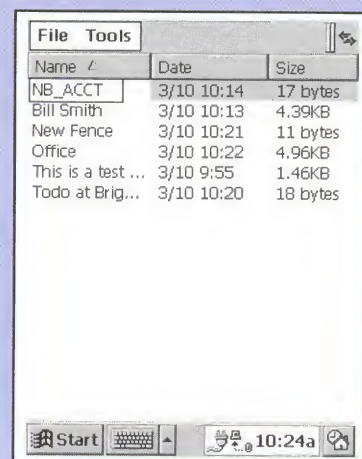
field with one-word descriptions of common tasks (Complete, Buy, Plan, Call, etc.). Let's say you need to buy three-tab folders for a tradeshow. Open a new task and tap on the pull-down list arrow in the Description field. Tap on "Buy" and then type in "folders for tradeshow." This helps further organize your tasks list because the list is alphabetized by the task name. All tasks beginning with "Buy" appear together in the main task list – handy when you go out shopping. You can attach text or ink notes to your tasks, to help clarify them. Screen 15 shows a hand-drawn picture of the three-tab folder you needed to buy for the tradeshow.

Voice Record

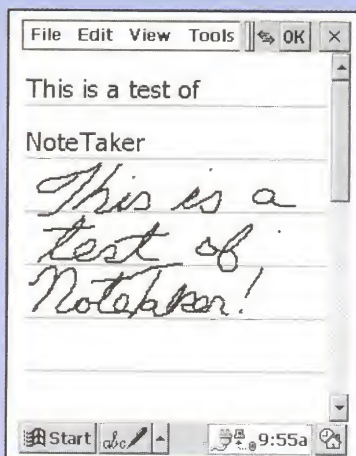
All Palm PCs come with voice record capability. The quality of the recording depends as much upon the hardware as software. This review is based on prerelease "beta" versions of Palm PCs from Casio and Everex. Only the Casio beta unit had the Voice Recorder enabled, but the Voice Record application is a Windows CE application – the same on all Palm PCs (see Screen 16, page 22). It was very easy to use, but a little hard to hear when I played it back, until I realized that the Palm PC's speaker was on the back of the unit. When I turned it over, I could hear the playback. You can tap on the volume controls icon



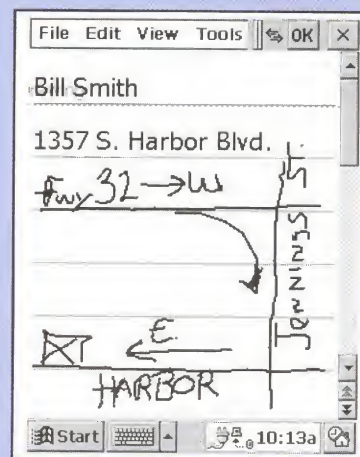
Screen 11: Highlight any item in the main Contacts list and a summary of the contact information appears at the top of the display.



Screen 12: Note Taker's main screen list the title of each note you've created.



Screen 13: Note Taker lets you enter text using the built-in Jot or soft keyboard options. You can also enter notes as handwritten "ink."



Screen 14: Note Taker is handy for sketching simple diagrams and maps.

in the top taskbar to access a sliding lever to adjust the volume.

Settings

Tap on "Settings" from the main Start menu and you get a list of applications that let you configure your Palm PC. The Settings option is much like the Control Panel on the H/PC, with a few new features., including:

Button Properties — lets you change the programs associated with the hardware buttons on the Palm PC. The manufacturer of the Palm PC will set defaults. For example, the Everex beta unit had Tasks, Contacts, Note Taker and Calendar set as defaults. Casio had Voice Recorder, Calendar, Contacts and Tasks. Whatever the manufacturer sets, you can customize the buttons to launch what you need.

Input Panel — lets you modify the input method and the way the built-in Word Completion feature works. I opened this one and tapped on the Options button to go to Jot Options. There were option buttons to select whether you were a left-handed or right-handed writer. I'm right handed and the left-handed button was checked. I doubt this is the default setting. More likely, the person who tested the Palm PC before me was left handed. I selected the Right-handed option and went back to Note Taker to play around with handwriting recognition again. I had better results this time.

This same panel lets you customize the Word Completion feature. You can set it to favor longer words, more common words, learned words, or a balance of the three. You set the Word Completion feature to display a list of up to four words as possible completions. When I first tested the feature it was set to display one word in the list, and it was frequently the wrong word. I set it to four and the correct word appeared in the pop-up list more often.

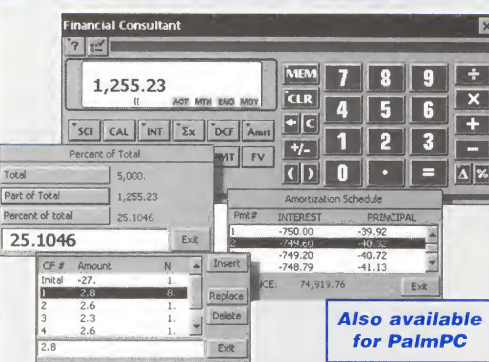
Radio is the only other option in Settings that doesn't appear in the H/PC's Control Panel. It's used to set up the Palm PC to use a wireless radio to receive pages and incoming messages. I didn't have a wireless receiver so I couldn't test this feature.

Synchronizing the Palm PC with your desktop PC

The Palm PC can synchronize with any PC running Windows 95. You need to install Windows CE Services on the PC and connect the Palm PC to the PC via the synchronization cable that comes with the Palm PC. Some Palm PCs will come with the cable

got apps?

Perform business calculations with ease



Financial Consultant 2.0

The Financial Consultant v2.0 is an advanced business calculator that combines many of the most popular features of HP and TI calculators. In addition to regular RPN and Algebraic input, "Solver forms" provide a unique "fill in the blanks" environment for solving a range of business calculations without having to memorize obscure keystrokes.

Features

- Algebraic and RPN input options
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- Date calculations
- Quick and easy Loan and Leasing calculations
- Forms based solvers provide unparalleled ease of use.
- On-screen Amortization tables

Also available
for PalmPC

Deal yourself in with our new card game collection



Casino Royal

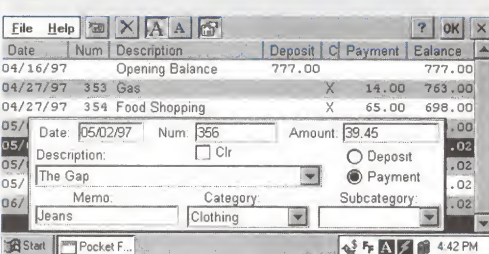
A collection of casino games including Blackjack, Ride On, Casino Stud, 7-card Casino Stud and Video Poker. Works in color on a color HPC. Compatible with the original 1.0 Windows CE as well as 2.0. Each game can be played with a stylus or from the keyboard.

Features

- Five great games with Colour support
- Highly configurable game play
- Includes Spanish 21 and Double Exposure
- Completely playable from the keyboard
- Five types of Video Poker
- On-screen payout tables

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Title !

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Pocket Finance

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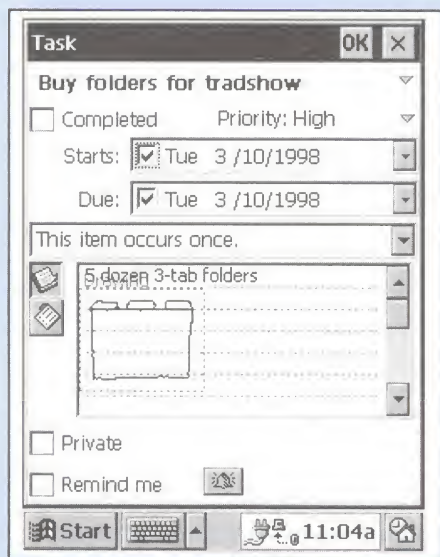
Features

- Rapid data entry
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- Font control.
- Supports QIF.

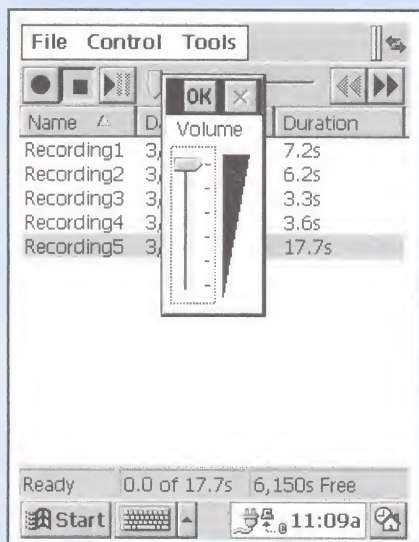
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Screen 15: You can attach text and ink notes to your tasks to give additional information about the task.



Screen 16: The voice messages you record are listed on Voice Record's main screen, which displays the date, time, and duration of the message (in seconds). The counter on the bottom right of the screen tells you how many seconds of recording time you have left, based on free memory available.

only. Others will have a cable and synchronization cradle (also called the "data cradle") as standard or optional equipment. The Casio beta unit I tested came with a cradle. I already had Windows CE Services installed on my desktop. I connected the cradle to my desktop PC via the synchronization cable, inserted the Palm PC in the cradle and nothing happened. I started to panic, and then remembered to check the physical connection. Sure enough, I didn't have the Palm PC seated in the cradle properly. I pulled it out, slipped it back in and pushed it firmly down into the cradle, and got a message on the Palm PC's screen indicating that it was connecting to the desktop PC.

Synchronization proceeded automatically. My Contacts list and Calendar from Outlook on my desktop PC were transferred to the Palm PC – but not my email messages! Fortunately, I'm reviewing a book titled "Windows CE 2 for Dummies" (Publisher: IDG Books; see future issue). I looked in the index and notice a reference for "Synchronization options." Page 246 told me to go to the Mobile Devices screen in Windows CE Services, and select ActiveSync Options from the Tools menu. Sure enough, I didn't have the Message option selected on the Tools menu. I selected it, pressed OK and my email messages downloaded from my desktop PC to the Palm PC. I opened my Inbox and it was full of new email messages.

Only time for a quick look!

I only had three days to look at the E-10 and Freestyle. I didn't have time to live with them for two to three weeks. When you live with something (or someone) for a while, you start to discover not only the dirt under the rug, but the gold under the mattress. I only had time for quick impressions.

One thing I didn't have time to test was the Channel Browser. You set your desktop PC up to get Internet content and it automatically downloads it to your Palm PC when you synchronize. This is going to be a very popular feature of the Palm PC, and I look forward to playing with it when I get a production Palm PC to test. Also, I didn't get to test any hardware or software from independent vendors. I look forward to this in the future.

Again, I want to thank (in alphabetical order) Daryl Scott at Casio and Michael Hu at Everex. Both men bent over backwards to get me a unit to test. Based on what I looked at and what I was told about the final production units, I honestly don't know which

one I'd choose (diplomatic, but true).

I'd like to end the review with three bits of Palm PC advice.

First, the Palm PC is smaller and a lot lighter than the H/PC. You won't notice it's there, and you're less likely to notice it's gone! Be consistent about where you keep it. It should be in your pocket, or in the data cradle. And back it up regularly in case you do lose it.

Second, in a pinch, you can use your fingernail to tap on the screen, and write notes. But you leave fingerprints all over the place! (I cleaned the screen three times.) Always put your stylus back – then you'll have it when you need it (more on this on page 52).

Finally, don't quit! Literally, DON'T QUIT! Leave the application running and start something else. By all means, press the power OFF button to conserve energy, but forget about quitting. It's good advice for life as well with the Palm PC. ■

Casio Casiopeia E-10 Palm PC — list price: \$499; synchronization cradle and cable; AC adapter. Available: late April, 98 at major office superstores. Contact: Casio, Inc.; Phone: 800-962-2746; Fax: 973-361-3819; Email: gensupport@casio.com; Web: www.casio.com

Everex Freestyle Associate A-10a — \$329; 2MB RAM; rechargeable battery pack; AC adapter, synchronization cable.

Everex Freestyle Manager A-15 — \$399; 8MB RAM; rechargeable battery pack; AC adapter Mobile Cradle with cable for PC synchronization;

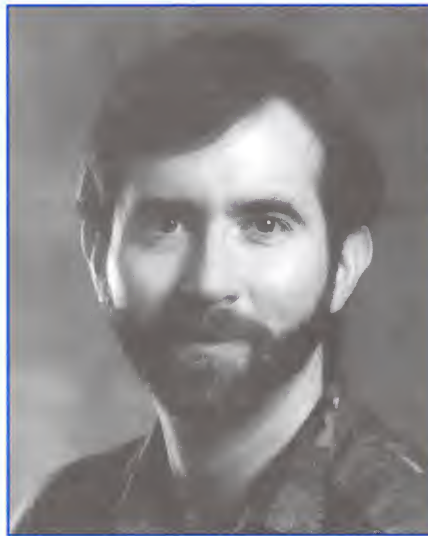
Everex Freestyle Executive A-20 — \$499; 8MB RAM; rechargeable battery pack; AC adapter Mobile Cradle with cable for PC synchronization (cradle has built-in 33.6 modem).

Available: late April, 98 at Comp USA. Available online at Comp USA direct (www.compusa.com) and Computer City Direct (www.computercity.com). Contact: Everex Systems; Phone: 800-EVEREX1; Web: www.everex.com

Interview

Microsoft's Dave Wecker

*Principal Engineer,
Palm PC Development Manager,
Mobile Electronics Products Unit*



Dave Wecker is Principal Engineer for the PC Companion product line (Handheld PC, Auto PC and Palm PC) as well as being the Development Manager for the Palm PC. He graduated from Carnegie Mellon with a BS in Electrical Engineering and an MS in Industrial Administration. After working for a few years as an International Business Consultant in developing countries he spent 13 years at Digital Equipment Corporation developing database and knowledge-base products and ending up at the Cambridge Research Lab heading speech recognition research. At Microsoft Dave has worked on video post-production, broadband MSN and H/PC v1 & v2. His hobbies include scuba diving, fly fishing and Telemark skiing. Dave has been married for more than 15 years.

Q: How long has Microsoft had a vision of a device like the Palm PC? Were you already thinking about it when you released Windows CE 1.0?

DAVE: I believe the concept of Palm PC devices pre-dates the Handheld PC. The original Handheld PC was the outcome of earlier work by this team which included work on a much smaller "communicator" device that embodied many aspects of a Palm PC. The problem was that the communicator was ahead of its time (too costly, not a mature enough infrastructure...) so it had to wait a couple of years.

Q: How did feedback from users of the Windows CE handhelds help shape software for the Palm PC?

DAVE: Input from Handheld PC users was invaluable. It let us know when we were on

the right track and also corrected our assumptions for what was really important to the typical user. We also spent a lot of time seeking input from both users and potential users (via focus groups). This helped us mold the entire line of PC Companion products.

We discovered that people really do have two distinct usage models. The first is the "Office Model." This is where I want to take data from my desktop with me, edit it and return it to the desktop. In this case the keyboard is of prime importance and where Pocket Office applications are important (Pocket Word, Pocket Excel, Pocket Power-Point). We call the second model the "Quick Access Model." The most important feature of this model is to be able to pull the device from my pocket, get the information fast, make a quick note to myself, and put it away. We found that it really does make sense to have two different types of devices for these different needs. We also found that the form



How's That Again?

Dave Wecker and his boss at the CES rollout of the Palm PC.

of the Palm PC was one of the most important features.

We had to make sure we hit a size that made sense to all parties involved.

Q: What were the biggest challenges you and your team faced in the development of software for the Palm PC?

DAVE: The challenges are always the same. You have to pick the right set of features: too many features and you can't meet development, production and other goals; too few and the user will not find it a useful and productive tool.

You have to pick the right shipping date: early enough so the market finds it interesting and late enough so you have time to develop, test, or market it properly.

You have to pick the right price so that OEMs are willing to build it and users are willing to buy it.

Q: How did Microsoft's concept of the device change as development proceeded? What features were added and what dropped away?

DAVE: The basic concept didn't change much, but different things became more important to us. The ability to operate a Palm PC with one hand wasn't at the top of our list at the beginning, but it moved higher as we went through the process. Likewise, as development proceeded we recognized the need to minimize the number of screen taps that it takes to get to any piece of data, as well as the need to reduce "clutter" on the screen.

We initially considered including speech recognition as a built-in feature, but decided not to. (It is available as a third-party software program for ART.) We found that speech recognition wasn't as important if we could make the voice memo capability as useful as possible. To this end, we made sure that the voice notes could be

Interview

organized and manipulated like other documents. For example, notes relating to a specific task could be stored in single folder, and all the notes in that folder played with a single command. We also chose to have the voice notes recorded in the standard .WAV file format so they could be easily played on other PCs and sent as an email attachment. Finally, to conserve limited file storage space, we used high compression rates to make sure that the voice notes took as little room as possible. To support text entry we added word completion capability for both handwriting recognition and the soft keyboards so that very few input strokes are needed to enter most words.

Q: What are the best things about Palm PCs?

DAVE: The best way to answer the question is with a simple example. Yesterday morning, I read my email and checked the day's appointments while walking my dogs! A Palm PC is a device that I can pull out of my pocket, get the information I need, update it if necessary, and slip it back in my pocket without breaking stride. In most cases I can get that information with one hand. While in the car I can grab my Palm PC, make a voice

"I carry both a Palm PC and a Handheld PC (it's a running joke around here that I carry one of EVERYTHING). I tend to do my time management (Calendar, Contacts, Tasks) on a Palm PC and office functions on the H/PC."

note, and play back my voice memo "to-do" list without ever looking at the screen. The sheer ease of use and instant availability of information is terrific. Another example: I had a doctor's appointment on Friday and the doctor was running late so I pulled out

my Palm PC and caught up on news and (the all-important) comics. I have subscribed to MSNBC and the COMICS channel using Mobile Channels on my desktop PC (via Internet Explorer 4). Whenever my Palm PC is docked to my desktop, ActiveSync updates all this information automatically.

Q: Who needs to buy a Palm PC? How is that person different from a user of a Handheld PC?

DAVE: As funny as it may sound, I'm not a zealot. I'm a firm believer in buying things that are useful to you (not "drawerware") so I don't like to say things like "everyone needs a Palm PC." On the other hand, I'm having trouble finding examples of people who either can't benefit from it or don't really want it. My usual response is that if you have a technique for information management (from a paper day planner to a pocket organizer) and you are perfectly happy with it, I wouldn't try to get you to change (this is why I'm not in marketing). However, if you've ever looked at what you're currently using and said: "I wish it could do this or that," then you should look at a Palm PC. My whole goal with this product is to give you that next level.

The user of the Handheld PC is more interested in "bringing their office with them." Programs like Pocket Word, Pocket Excel and Pocket PowerPoint are very important to them. They will typically use their device in many of the same ways as their laptop (mail, note taking in meetings, presentations...). The Palm PC is targeted more for "unstructured" use. You're on the go and need to have information with you (PIM, Web, Notes). Unstructured data is more important for this type of device (Ink and Voice). I don't think the users are different, just the usage.

Q: Do you use both an H/PC and Palm PC? What is the difference between the way you use the devices? Is there any point on keeping PIM information on both?

DAVE: I carry both (it's a running joke around here that I carry one of EVERYTHING). I use the Handheld PC to take notes in meetings (I keep my entire work diary on it). I also use it for my spreadsheets and presentations. It also has a lot more memory so I tend to use it as an archive of information. I tend to dock it at work and make a conscious effort to take it to meet-

ings. A Palm PC is much more of an "unconscious" carry. I have it with me at all times; I use it to refer to information quickly and make quick notes on it whenever I need to. I tend to do my time management (Calendar, Contacts, Tasks) on a Palm PC and "office" functions on the Handheld PC.

I keep both completely synchronized. I never know which one I'm going to need to refer to and with Continuous Sync there's no effort involved (if I drop a device in a docking cradle, whenever I take it away it will be synchronized).

Q: The Palm PC interfaces with the H/PC and Auto PC via the infrared ports. Why is this feature important?

DAVE: In general, all the PC Companions can exchange many sorts of data (exchanging a business card is the usual example). My favorite is being able to get into a car with an Auto PC and downloading all my contacts from my Palm PC via IR. This allows me to bring up address information and dial the phone in the car without having to enter all my address book information by hand. Infrared communication also lets me take documents I've edited in a meeting and beam them to other people in the room... on the spot. Also, don't forget that some of the games on the Windows CE Entertainment Pack are multi-player games that use infrared communication.

Q: Will we be able to interface our Palm PC with other Windows CE based devices, such as WebTV and other embedded systems? Why will this be important?

DAVE: Interface is a tricky word, since there is always some way to do it. One of the nice things about being built on top of a consistent platform is that it makes this sort of scenario clean. The only caveat I would have is on the hardware, not software, side. For example, a WebTV box may use IR but it might be Consumer IR, which is not the same as what is currently in the Palm PC (which speaks IrDA). This is a choice made by the manufacturer. There is nothing keeping an OEM from building a Palm PC with Consumer IR (and I would encourage it). By the way, a Palm PC with Consumer IR would also allow you to use your Palm PC as a very smart TV/VCR remote control. So in the "possible scenario" area I could envision

using your Palm PC as a home controller for your security, comfort, entertainment, communication and information needs.

Q: What are the differences between the seven Palm PCs that have been announced so far?

DAVE: One of the goals that Microsoft has in creating "targeted categories" like the Handheld PC, Auto PC or Palm PC is to provide a core definition of hardware and software that the consumer can count on. This means that when you pick up a Palm PC it will (by definition) have a certain set of hardware controls and certain guaranteed software applications (all layered on Windows CE). At the same time OEMs are free to extend both the hardware and the software above this core definition in areas

"Yesterday morning, I read my email and checked the day's appointments while walking my dogs! A Palm PC is a device that I can pull out of my pocket, get the information I need, update it if necessary, and slip it back in my pocket without breaking stride. In most cases I can get that information with one hand."

of their own choosing, allowing for market differentiation.

Examples from the currently announced set of Palm PCs include the following: vibration (for silent notification of meetings or wireless data arrival), audio jacks for external headphones allowing audio content to be loaded from the Internet and played later, dif-



The Whole Team

Dave and the H/PC development team with some of the Windows CE Handheld and Palm PCs.

fer-
ent
power
options (battery sizes, rechargeables, docking stations), modems (both soft and hard), different screen contrasts and back lighting and various types of packaged software (both in ROM and layered).

Q: What makes a Windows CE-based Palm PC a better solution than, say, the PalmPilot? Would a PalmPilot user want to switch to the Palm PC?

DAVE: I want to first state that I have a lot of respect for all the people working on these types of devices. I own every one of the devices in this category (one of the perks of the job) and they all show a great deal of innovation and hard work. I think the Palm PC is the first device that moves this category to a higher level. As I said earlier, if you are happy with your current solution I wouldn't try to talk you out of it. On the other hand, if there are things you wish you could do on some of these other devices and can't, I would definitely encourage you to take a look at a Palm PC. I am happy to state that we had many PalmPilot users in our Beta program and I'm not aware of any that wish to return to their previous device.

Q: What, in your opinion, are some of the best third-party products that will be released for the Palm PC?

DAVE: To be honest, I've been so busy getting the device finished that I haven't had much time to look at the third-party applications (yet). At CES we announced over 69 third-party applications and that number is growing fast. Personally, I'm looking forward to "customization applications" that turn the device into something else (i.e., a language translator, an expense tracker, data collection using simple forms, and of course, the games!).

Q: Everyone discovers things to do with new platforms and operating systems that weren't thought about by the designers. What are some of the un-planned-for uses for the Palm PC that you've discovered?

DAVE: I was a little surprised at the amount of vertical interest in the Palm PC (health care, parcel delivery, real estate, etc.). Because Windows CE is a Win32 platform, people are jumping on it as a great way to "mobilize" their workforce. I think over the next six months I'm going to see uses I never dreamed of (and it's my job to try to think of them all before hand)!

Q: Where do Windows CE-based devices need to grow?

DAVE: There are several directions. I think the first obvious area is in wireless. We've laid an excellent foundation with an architecture that supports 1 and 2-way solutions (as well as integrating with desktop synchronization). Now we need to see growth in the infrastructure and peripherals area (the various 1-way pager devices are an excellent first step). Of course, when we start talking 2-way wireless communication, battery life becomes an issue. I think that there are some excellent possibilities on the horizon to help this. My personal pet peeve is size. I want the wireless devices smaller and this will take some (read: "a lot of") effort both on the hardware side and on the User Interface (UI) side.

Q: Tell us a little about Microsoft's approach to improving its operating systems. How does Microsoft go about improving its products?

DAVE: One of the main things that happens is you have to make tradeoffs. I subscribe to the philosophy (from Dave Cutler of Windows NT fame) that you can let the schedule slip for the sake of quality, but not for features. This means that there will always be a lot of features that don't make it into a particular version of a product. You pay attention to how the product is received, and what users tell you about what they really liked, hated and missed. This feedback comes from Marketing, who works with Program Management to generate specifications for the next product. Then Development and Testing take a look at the specifications and tell us how long it will take to develop (usually, too long). Features get cut or changed, a new set of specifications is finally agreed upon, and we build it. Along the way there are sanity checks from our Usability group. They look at designs and test them (with real customers) to see what makes sense and what could be better. In our case they also worked on the various new hardware concepts including scrolling and application startup buttons. We also test with focus groups, analysts and the market itself.

Q: What's the future of the Palm PC? Where do you see it going? How will it grow, change, improve?

"I'm not a zealot. I'm a firm believer in buying things that are useful to you (not 'drawerware') so I don't like to say things like 'everyone needs a Palm PC.' On the other hand, I'm having trouble finding examples of people who either can't benefit from it or don't really want it."

DAVE: I see the Palm PC as a ubiquitous device. It's useful enough, small enough and priced low enough that people who never before thought of carrying a portable computing device won't walk out the door without it. It's hard to say where the future will lead, but it will include new form factors, new applications, integration into other products even new UI paradigms. All are possible... you'll just have to stay tuned! ■



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Quick Tips & Handheld PC Tricks

Security and the Handheld PC

Tips and hints on keeping your H/PC and its data safe and secure; from the Windows CE Forum on Computing Central (The Microsoft Network)

By Todd Ogasawara

The great thing about Handheld and Palm PCs is that because they are small and very portable, you can keep important data with you at all times. Unfortunately, this portability makes them easier to drop and damage, to misplace, or to have stolen. If this happens, you may lose valuable data, or worse — have it fall into the wrong hands. Below is some advice on how to protect your PC Companion, and more importantly, how to protect the data on it.

Physical Security

If your H/PC or Palm PC easily slips into your pocket, it can easily slip out — when you bend over to pick up something, when you sit down at a restaurant, when you get into a taxicab. You can leave it on your desk in a crowded office, go to lunch, come back and find it missing. You can pull it out, check on a phone number, make the call from a phone booth, and walk away from the phone booth and the Palm PC. In a crowded shopping center a skilled pickpocket can lift your wallet or H/PC without you even noticing it. Here are some tips to help avoid these unfortunate scenarios.

Keep it with you all the time in a secure place. Most first generation H/PCs and some second generation H/PCs will fit in a man's coat or pants pocket, or a woman's purse. An H/PC can easily slip out of pants pockets when you sit down. You might want carry it in your inside coat pocket. If it's too snug there, get a carrying case with a shoulder strap or belt strap. Many padded carrying cases designed for cameras work as well as one specially designed for the H/PC. Recently, I ran into the problem of finding a carrying case for my new NEC MobilePro 700 (a mini-notebook form factor Windows CE 2.0 H/PC). None of the current H/PC or mini-notebook (Toshiba Libretto form factor) carrying cases fit the NEC.

Fortunately, I found an Eagle Creek padded case (www.eaglecreek.com). It is designed to hold a video camera that fits the width of the NEC perfectly. In addition, it has a number of pockets to hold cables, spare batteries, and pens.

In your office or cubicle, you might also want to lock your H/PC in a drawer when you get up to go somewhere. It is probably better to carry it with you, get it out when you need it, and put it back in your pocket or purse.

Be consistent about where you keep your H/PC. When you're on the go, keep it in the same pocket; at the office, keep it in your pocket, in the data cradle, or locked in your drawer; at home leave it on the desk in your study or the night-



About The Author

Todd Ogasawara is the forum manager of the Microsoft Network, Computing Central, Windows CE Forum and Telephony Forum. He has been working with computers of all sizes and with all kinds of operating systems since the mid-1970s. He lives in Hawaii with his wife and daughter. The Windows CE forum is found at: <http://computingcentral.msn.com/forums/windowsce/>.

New URL for COMPUTING CENTRAL

Note the Computing Central (on the Microsoft Network) Windows CE Forum has a new web URL. It is now found at <http://computingcentral.msn.com/forums/windowsce/>

Its dozens of Windows CE related newsgroups (including separate newsgroups for the Handheld PC, AutoPC, and PalmPC) can be found by clicking on the "Newsgroups" link on the home page.

stand by your bed. Consistency is the key. As soon as you start leaving your H/PC in unusual places, you'll forget where it is and walk away from it.

Don't leave it around on desktops, restaurant tables, or any unusual places.

Write down your system's serial number and store it in a safe place (a safe deposit box and/or money belt, for example). This will help you identify your system if it is recovered after theft or misplacement.

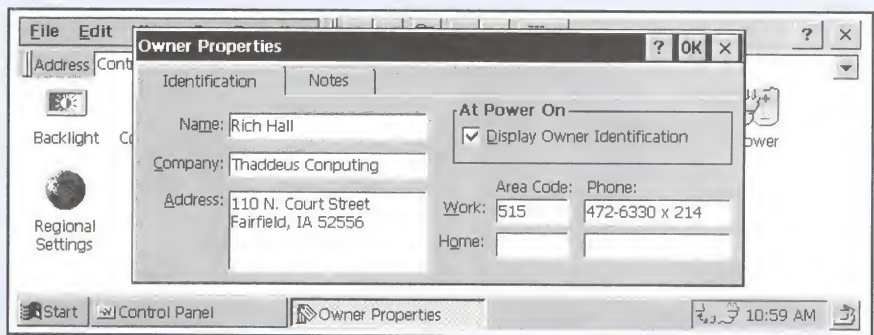
Make sure you have your name and phone number in the owner screen or tape a business card to the back of your H/PC or Palm PC. The words "\$100 reward if returned to..." may help motivate people who find your H/PC to give you a call (see Screens 1, 2 and 3).

This one may be overkill. The Masterlock cable lock for notebook computers comes with a small postage stamp sized securing block. You could use this securing block and a cable with your H/PC. The HP 620LX has a built-in latching area for the Masterlock cable lock. You can find it by looking at the left rear area of your HP 620LX. However, it can be a challenge to find an object to secure the cable to though.

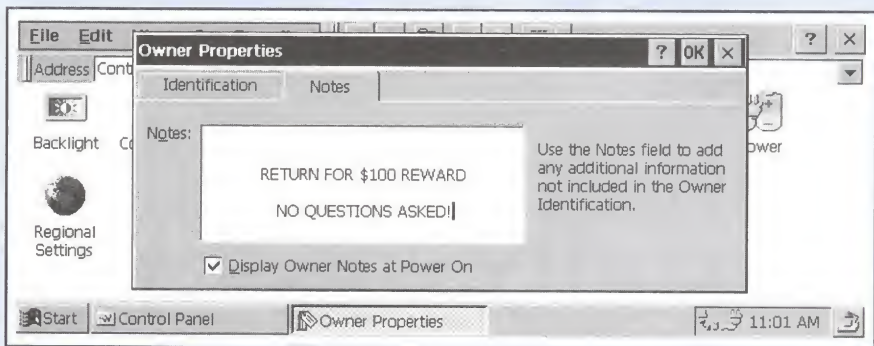
Data Security

Far more valuable than the hardware you carry in your pocket is the data on it. If you damage or lose your H/PC, you can always plunk down some money and buy another one. That is not always the case with vital information. In addition, some of the information on your computer is for your eyes only (credit card numbers, PIN numbers, notes about important clients — all sorts of things).

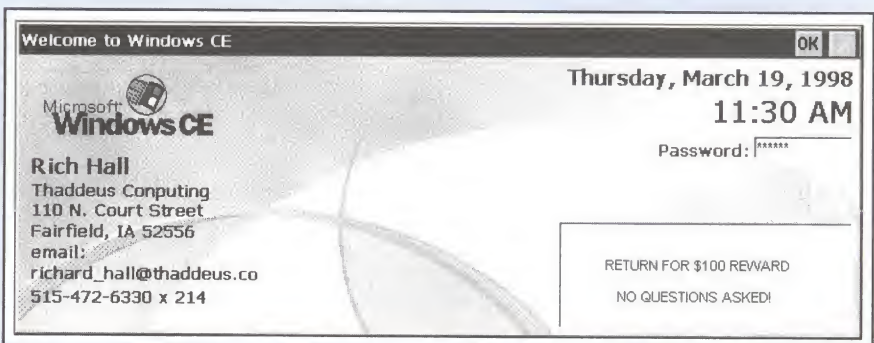
All the advice about physical security applies in this section. But data theft can occur without losing your H/PC and without you knowing it. Someone can see important data on your screen or copy it over from your H/PC via infrared beaming or other methods. In addition, you can accidentally lose confidential or other data due to a



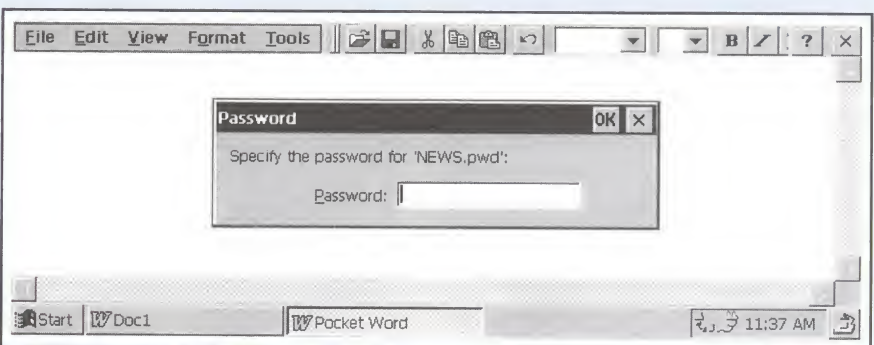
Screen 1: The Owner Properties setup screen is accessed from the Owner icon in the Control Panel. Fill in your contact information and make sure the Display Owner Identification box is checked.



Screen 2: Select the Notes tab from the Owner Properties screen and fill in the desired reward information (or other message). It works best if you use the spacebar to center the message in the text box. Make sure you check the box labeled, Display Owner Notes at Power On.



Screen 3: Whenever you (or someone who finds your H/PC) presses the power On button, the contact and reward information is displayed.



Screen 4: In addition to system-wide password protection, you can password protect individual Pocket Word and Pocket Excel documents. Select the Password option from the File menu. Whenever you try to open the document you will get this screen, requesting the password.

variety of non-malicious causes, including battery failure (both main and backup batteries) or a software error that damages the file and data. You might even incorrectly enter a person's phone number or address. Here are a few ideas to you help you keep your data safe.

Both Windows CE 1.0 and Windows CE 2.0 let you set a power-on password. Whenever anyone presses the ON button, they must enter a password to access the system (from the Start menu select Settings/Control Panel/Password). Screen 3 shows the Power On password box in the upper right of the screen below the date and time.

Windows CE 2.0 adds password protection for individual Pocket Word and Pocket Excel files (from Pocket Word select File/Password). Screen 4 shows the Password dialog box that pops up when you try to open a password-protected document. The trick is to remember the password you assign to each file. You may want to write them down and keep them somewhere safe or you may want to use the same password for all files.

Intelliant's DocSafe (www.intelliant.com) password protects any file and works on your H/PC as well as your desktop or notebook PC (see Screen 6).

My favorite Windows CE application for the past few months has been eWallet from Ilium Software (www.ilium.com). This application stores confidential data (passwords, PINs, credit card information, etc.) using a 40-bit encryption method. You access eWallet using a single password. eWallet displays your confidential data in a tree structure hierarchy (see screen 7), making it easy to navigate and use. It comes with a number of preset formats (credit card, calling card, etc.) as well as a free form card format. eWallet will automatically close down if left idle for a preset period, making it difficult to accidentally leave important information open on your H/PC. I use this great little application at least a couple of times each week.

Both Windows CE 1.0 and 2.0 let you synchronize your contact list, calendar, and task list with Microsoft Outlook or Schedule+ on your desktop PC. In addition, you can backup important files to your desktop PC. You should strongly consider backing up the two main Outlook files on your desktop PC's hard disk to some removable medium (disk or tape). The two files you want to find are most likely named mailbox.pst and mailbox.pab. The mailbox.pst file can be quite large if you tend to keep a lot of e-mail. You will have to close down any software that accesses these files (Outlook itself, or WinFAX Pro 8.0's Operator).

The Hewlett-Packard's 320LX, 360LX, and 620LX all have a bonus Control Panel application that lets you backup Information Manager (Calendar, Contacts, Tasks) and InBox data to a CompactFlash RAM card for safety. This lets you

backup and restore without having to dock with a desktop or notebook PC.

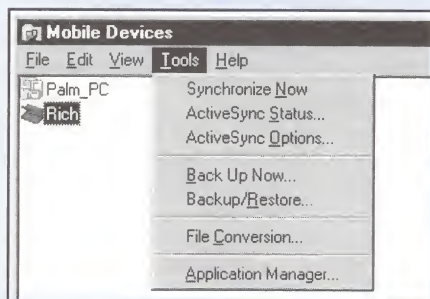
dbFlash software (see Screen 8) can be used on any H/PC to perform a function similar to the Hewlett-Packard utility described above. (dbFlash is from Anyware Consulting, found at members.aol.com/anyware/wce/).

All H/PCs allow you to perform a complete system backup to a desktop or notebook PC using Windows CE Services (Screen 5). You should do this on a regular basis, but be aware that if you have to restore from this backup, you restore the complete system — you can't pick and choose files to restore.

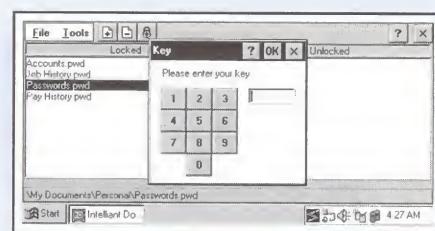
HPCVault (see Screen 9) extends Windows CE 1.0 and 2.0's backup/restore capability and allows you to restore specific files to either your H/PC or your desktop (HPCVault is from Anyware Consulting).

Almost all H/PCs support some kind of additional non-volatile storage cards (PC Card, CompactFlash, or Velo's proprietary memory cards). These cards are a great way to extend your H/PC's storage capabilities (more maps, information, text files, etc.), but they tend to have slower access times than your system RAM. A 15 or 16MB card now costs under \$200 U.S. While more expensive than adding 16MB to your desktop PC, it is a relatively inexpensive way to add additional storage memory to your H/PC. These cards also provide a great backup medium when you are on the road. But if you use them to back up your data, you'll want to remove the card from the H/PC afterward and keep it somewhere else. If you keep it in the H/PC, and lose the H/PC, you lose the card and your backup.

That's it! You have just read what I hope is a useful collection of hints and tips to help you protect your H/PC and its data. It is, however, not an exhaustive list. Please add your hints and tips on my WindowsCE. Tips_FAQs newsgroup (see sidebar). ■



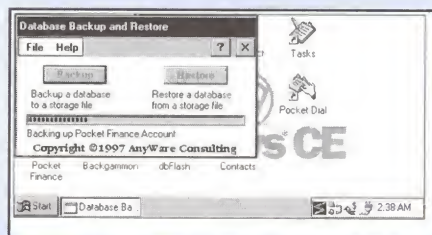
Screen 5: Protect your H/PC data by backing it up regularly. Connect the H/PC to your desktop PC and activate Windows CE Services. Then, from the Mobile Devices screen select the Back Up Now option from the Tools menu.



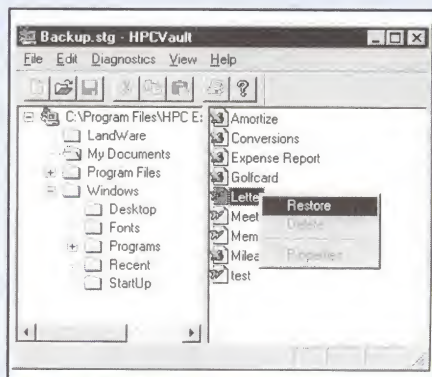
Screen 6: DocSafe lets you password protect any file and works on your H/PC as well as your desktop or notebook PC.



Screen 7: eWallet stores confidential data (passwords, PINs, credit card information, etc.) and lets you access it using a single password. eWallet displays a list of your confidential data in a tree structure hierarchy (right side of screen) and the complete information of the selected item on the left.



Screen 8: dbFlash lets you backup Calendar, Contacts, Tasks and InBox data to a CompactFlash RAM card. This lets you backup and restore without having to dock with a desktop or notebook PC.



Screen 9: HPCVault operates from your desktop PC and lets you backup and restore specific files.

PC COMPANION NEW PRODUCTS

The PC Companion Products listed here include hardware, software, services, and resources. Prices listed are suggested retail price. Unless otherwise indicated, software products are delivered on floppy disk. Listings do not represent an

endorsement by the editors. To announce in our next issue, please send an email message to editor@thaddeus.com. For live links to the web sites mentioned in this section, visit our web site at www.thaddeus.com, or purchase our PowerCD.

Hardware

Accessories

Duracell Ultra Batteries

Duracell has recently introduced this new brand of high-capacity alkaline batteries for handheld/palm PCs and high-tech devices. According to company literature the batteries will last 50% longer than ordinary alkaline batteries and be available in AA and AAA sizes. Like other Duracell batteries, the Ultra comes with the PowerCheck strip to let you test the battery's power level. The suggested retail price will be approximately 20% more than current Duracell alkaline batteries (i.e., a AA four-pack will cost around \$5.00).

Price: \$n.a.

Use with: H/PC, Palm PC

Available in May at retail outlets

Contact: Duracell North Atlantic Group

Web: www.duracell.com

Targus Handheld Cases

Accommodates all popular models of H/PCs and PDAs.

— Handheld PC Slipcase (#CH100): Includes outside pocket for PC Cards and belt clip.

— Handheld PC Leather Wallet (#CH200): Room for H/PC, PC cards, disks, credit & travel cards, pen, business cards & checkbook.

— Handheld PC Leather Double Wallet (CH300): Room for H/PC, PC cards, disks, spare batteries, credit & travel cards, pen, business cards & checkbook.

— Leather Mini-Notebook Case. (#CH400): Accommodates larger H/PCs, spare battery pack, PC cards, credit & travel cards, business cards & pen.

— Handheld PC Organizer (#CH500):

Accommodates larger H/PCs, connectivity cables, batteries, PC cards, business cards, pens, etc.

— Handheld PC/Mini-Notebook Leather Portfolio (#CH600): Accommodates all of the above, plus writing pad.

Price range: \$19.95-\$99.99

Use with: H/PC, Palm PC

Contact: Major computer/office supply stores or Targus fulfillment line;

Phone: 800-400-1011 / 714-523-5429

Fax: 714-523-0153

Web: www.targus.com

Cables and Connectors

Mobile Konnector

Takes the signal from digital (PBX) phone systems and converts it to a safe, standard analog signal used by most fax/modems. Includes 2 9V batteries. No AC power required.

Price: \$149.95

Use with: H/PC and Palm PC modems

Contact: Unlimited Systems

Phone: 619-622-1400

Or Mobile Planet;

Web: www.mplanet.com

Modem connectivity cables

SupplyNet, Inc. supplies replacement connectivity cables for most PCMCIA cards, including cables for modems; cellular phones; ethernet cards and SCSI cards. They have cables for cards manufactured by 3COM, US Robotics, Megahertz, Xircom-TDK, Apex Data, EigerLabs, Hayes & Zoom & Telephonics & and more than 50 others. All cables are in stock and available for immediate world-wide delivery.

Price: \$varies

Use with: H/PC and Palm PC modems

Contact: SupplyNet, Inc, USA;

Phone 800-826-0279; Fax: 914-267-2420

Email: info@thesupplynet.com

Web: www.thesupplynet.co

Hardware/Development

ES2110 Single Board Computer

For developers of Windows CE embedded systems (not end users). A single board computer measuring 75mm by 100mm, using the 72 MHz Hitachi H7709 RISC processor. Minimum memory configuration of 2MB flash and 4MB of DRAM. Can support up to 16MB of flash or ROM memory and 32MB of DRAM memory. Hardware supports multiple I/O, including LCD, touch screen, infrared, PS/2 keyboard, PCMCIA sockets, and parallel ports. Comes with two 100-pin configurable expansion slots. Additional I/O, including ethernet and modems supported by optional 49mm by 75mm expansion board. Requires a single, low-power 3.3 volt power supply.

Price: \$varies

Find What You Need

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Use with: Desktop PC development for Windows CE
 Contact: Eclipse International, Inc., Attn: Thomas Wong
 Phone: 415-691-6555; Fax: 415-428-0292
 E-mail: twong@eclipseint.com
 Web: www.eclipseint.com

PC Cards

EXP Data Traveler 336E

A cellular-ready 33.6Kbps PC Card fax/modem that comes with its own detachable battery pack, so it doesn't drain your H/PC's batteries. The pack uses two AA batteries, which power the modem card for up to two hours of continuous use.

Price: \$189.95
 Use with: H/PC
 Contact: EXP
 Phone: 800-397-6922
 Web: www.expnet.com
 Mobile Planet: www.mobileplanet.com

CompactFlash Cards from SanDisk

SanDisk recently announced the availability of new higher-capacity CompactFlash cards for use in H/PCs, Palm PCs and Auto PCs. SanDisk CompactFlash memory cards are available in 2, 4, 6, 8, 10, 15, 20, 24, and now 30, 40, and 48 MB capacities. These cards are sold under the SanDisk brand label and under the brand names of other computer and camera manufacturers.

Price: \$varies
 Use with: H/PC, Palm PC, Auto PC
 Contact: Major computer and camera retailers or SanDisk
 Phone: 408-542-0500; Fax: 408-542-0503
 Web: www.sandisk.com

ImageMate CompactFlash Card Reader

SanDisk's ImageMate connects to your desktop or notebook PC's parallel port and lets you read from and write to industry-standard CompactFlash cards from your desktop/notebook. H/PC and Palm PC owners can use this to quickly backup important files to the desktop and copy files to and from their PC Companion. Owners of digital cameras that store images on CompactFlash cards can use this device to download images from the camera to a desktop PC. [Note that translation of Word and Excel documents to and from Pocket Word and Pocket Excel formats must be done through Windows CE Mobile Services. This means that you can't simply

copy a Word or Excel document from your desktop to a CompactFlash card via ImageMate and then insert the card in your H/PC.]

Price: \$99
 Use with: Desktop PC
 Contact: Major computer resellers or SanDisk
 Phone: 408-542-0500; Fax: 408-542-0503
 Web: www.sandisk.com

Software

Calculator/Financial

Quicken ExpensAble for Windows CE 2.0

A portable expense management system that lets you capture, group, preview and store travel expenses on the go! Print basic summary reports using the desktop utilities that come with ExpensAble for Windows CE. You can transfer expense reports envelopes created on your H/PC to a desktop PC with Quicken ExpensAble for Windows 95/3.1.

Quicken ExpensAble for Windows 95/3.1 enables you to access user friendly Hotel, Trip and Currency Genies and allows you to scan receipts attachments, process expenses, print reports, track budgets, E-mail reports and even export to Excel!

Price: \$49.95

Use with: H/PC
 Sales contact: On The Go Software
 Phone: 714-545-2210; Fax: 714-545-0422
 Web: www.onthegoftware.com
 Also available online at
www.buydirect.com or from
 Mobile Planet www.mobileplanet.com

Formulae 1 CE

Graphing calculator for Windows CE designed for the teaching and exploration of mathematics. Gives the user the ability to see the intermediate STEPS taken to solve any problem. Supports Arithmetic, Polynomials, Matrices, Functions, Algebra, Calculus, Graphing, Finite, Trigonometry, and much more.

Price: n.a.
 Use with: H/PC
 Contact: Poliplus Software
 Phone: (519) 747-0668; Fax: (519) 747-0332
 Email: cbazza@poliplus.com
 Web: www.poliplus.com
 Web: www.pdacentral.com

Handwriting recognition

smARTwriter CE Plus

Provides handwriting recognition on your PC Companion. Learns to recognize your handwriting instead of requiring you to learn its characters. Initial training takes five minutes. Can train smARTwriter to recognize symbols as words (i.e., "b/c" can stand

Link-A-Printer II

Smaller size & Attached cable



Link-A-Printer II is a serial to parallel converter that allows direct printing from your Windows CE HPC to any parallel printer. It also works with the HP 100/200/300LX and the HP OmniGo. Some HPCs may require bPrint software.

\$79

Also Available Link-A-Printer I

Requires HPC to computer connectivity cable and optional battery Features auto on/off fixed 9600 baud

\$59

Now Available

bPRINT, bFAX, and bFAX Professional software for use with Windows CE HPCs.

GREENWICH
 INSTRUMENTS USA

Tel: 704-875-8490
 Fax: 704-875-2801
 Toll Free: 800-476-4070

For European Distribution
 Network Contact:
 Greenwich Instrumrnts LTD.
 Tel: 011-44-181-302-4931
 Fax: 011-44-181-302-4933

Products

for "because"). Pop-up editing window lets you easily customize smARTwriter. Works with any H/PC or Palm PC.

Price: \$69

Use with: H/PC, Palm PC

Contact: Advanced Recognition Technologies (ART)

Phone: 888-ARTCOMP or 818-678-3999

Fax: 818-678-3994

Web: www.artcomp.com

Retail

Pro/Pocket Windows CE

Software application that runs on a Windows CE H/PC and is used to collect retail information on a store-by-store basis. Information is then transmitted via modem to Pro/Server (the backend database) for consolidation and reporting. Lets manufacturers, brokers and retailers track store-by-store conditions on a daily basis and react quickly to changes in the market.

Pro/Pocket runs in a Windows CE environment on a hand-held personal computer. The Pro/Pocket system delivers, via e-mail, a hyper-text markup language (HTML) page for each scheduled store call for the current or future day, containing read-only store profile information, editable store profile data, editable call data, and survey questions with editable responses.

Running on a 2MB or 4MB H/PC, it is possible to track data on 100 stores on one H/PC and, if necessary, work for several days without connecting to the main

ProServer database. Pro/Pocket is one of Pricer/Intactix suite of field force automation software, including: ProServer (the backend database), ProActive (running on Windows 95 devices) and Pro/Cal (which uses a telephone for data collection).

Price: \$varies

Use with: H/PC

Contact: Pricer/Intactix

Phone: 770-246-1700

Web: www.intactix.com

Software Development

NStall Wizard

Provides developers with easy and quick way to add a professional looking installation routine to their Windows CE 1.0 and 2.0 software program. A single installation package handles both versions.

Shareware registration price: \$65.00

Use with: Desktop PC

Web: www.nstall.com/

Demo available: www.pdacentral.com

HPC Trace

Lets you view debugging messages from any DLL or program on your H/PC. All you have to do is install HPC Trace on the H/PC and add debugging messages to your code. HPC Trace comes with the C++ header file that you can include into your code, and an example program that shows how to add

debugging messages to your code. To see debugging messages just run HPC Trace on the H/PC before executing your application (or DLL).

The program, including help files, requires less than 30K of storage space on your H/PC. It runs on HS3-used and MIPS-based Windows CE compatible Handheld Personal Computers such as Cassiopeia A-10 or Philips Velo 1.

Price: \$n.a.

Available online: www.phatware.com/ or www.pdacentral.com

RIO Wizard for Windows CE 2.0

An application development tool that adds on to the Microsoft Windows CE Toolkit for Visual C++ version 5.0. Using wizards and an easy-to-use visual builder, RIO Wizard lets a Visual C++ programmer create mobile database applications complete with graphical user interfaces (GUI) for the Handheld PC (H/PC) and the Palm PC.

RIO Wizard automates many Microsoft Foundation Classes programming details that application development can be as easy as drag-and-drop. The product comes with TechBridge's own MFC class library extension - RRecordset, which adheres to the interfaces of Microsoft's MFC CRecordset class for the desktop. RRecordset has built-in support for thin-client ODBC driver to access remote server database through wired or wireless network.

Price: \$n.a.

Use with: desktop PC (develop for H/PC, Palm PC, Auto PC)

Contact: TechBridge Technology Corp., Canada

Phone: 905-513-7800; Fax: 905-513-1330

E-mail: sales@tbridge.com

Web: www.tbridge.com

Rainbow

Development tool to enable web server support to Windows CE based devices.

Small footprint requiring as little as 50K ROM; Full HTTP/1.0 support and HTTP/1.1 subset support. Fully compatible with industry standard web browsers such as: Microsoft Internet Explorer®; 4.0 and Netscape Navigator®; 4.0 OEM Developer's Kit (ODK) includes application wizard for CGI creation, server loaders for various hardware platforms as well as sample code and CGI extension DLLs.

Price: \$ n.a.

Use with: development tool

Web: www.intrinsyc.com/products/rainbow/

AUTOMATING YOUR WORK FORCE? GET **EXPERT** ADVICE AND THE TOOLS YOU NEED

SHIER Systems' commitment is to provide our clients with faster, easier and less expensive ways to create, access and manage their information.

This can often be accomplished with low-cost off-the-shelf ultra-mobile computing and communications tools integrated into networked environments. We specialize in making this work for you.

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E-mail: info@shier.com

SHIER Systems is a full-service systems integrator, value-added reseller and consulting firm focusing on highly mobile work forces.

Why learn by trial and error if you don't have to? Take advantage of our years of experience with thousands of customers who are satisfied with their tools and are gaining a competitive advantage today.

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SOLUTIONS GROUP!**

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Put our expertise to work for you.

In the PIPE LINE

Below are a couple of products in the works for the Windows CE PC Companions. If you are developing anything for Windows CE, or here of anything in development, email me at richard_hall@thaddeus.com.

More Power for your Cassiopeia A-20

From Chris De Herrera, AOL Windows CE Forum Consultant; Email: PDCChrisD@AOL.Com; Web: members.aol.com/pdcchrisd/

I've been testing a new battery from Portable Energy Products, Inc. (www.power.com) with my Cassiopeia A-20. Their CD Battery Pack is plug and play although it's not certified by Casio or Portable Energy Power for use with the Casio A-20. It has offered me 14 hours of use with the backlight on, Socket Ethernet card and Sandisk Compact Flash without depleting the internal batteries. That's about 4 times the normal use with regular alkalines (3.2AH at 4.5v). It is a no-maintenance sealed lead-acid battery pack the size of a CD jewel case and it weighs 12.5 ounces. The battery does not have any memory effect and can be charged up to 500 times using your Casio's standard AC

adapter. The charging takes about 16 hours. The CD Battery Pack is available from their website for \$39.95. Portable Energy Products will be coming out with customized versions for the various Windows CE systems.

Pocket-sized databases for Windows CE

Oracle and Sybase have announced plans to release Windows CE versions of popular database programs. According to sources, Oracle Lite and Sybase Adaptive Server Anywhere will be available in the third quarter of this year. The programs will be smaller and provide fewer features than the full sized versions, but will provide mobile users with the ability to interface with corporate databases. For further information, contact Oracle at 650-506-7000, Web: www.oracle.com. Contact Sybase at 510-922-3500, Web: www.sybase.com.

Use with: H/PC

Web: www.phatware.com or www.pdacentral.com

Utility/Productivity

ClassPro

Student organizer that lets you track classes and display class information, schedule tasks and take notes. Can be used as an organizer for non-student activities and notes.

Price: \$29.95

Use with: H/PC

Web: www.developerone.com/

Demo available: www.pdacentral.com

HPC dbExplorer

Lets you browse and manage databases on your Handheld PC. Similar to Windows CE Explorer only it works with databases stored on the Handheld PC. Implements functions that are unavailable in Windows CE explorer such as: Copy, Rename, Delete, Backup, Restore, and Transfer databases. You also can view your databases using small or large icons or see a detailed list. You can sort databases by Name, Date, and Size – in ascending or descending order.

Price: \$24.95

Diary Companion 1998

Update your appointment calendar with holidays, festivals, and other notable dates from around the world. Particularly useful for travelers and others who need to be aware of important dates in other countries. The installation program lets you quickly select countries and categories of information relevant to you. The information is then automatically inserted into the H/PC's Calendar. Dates and events covered include:

- Domestic and international public holidays from 60 major countries around the world
- Religious festivals for most world religions
- Notable dates (e.g. Mother's Day; clocks change): UK, USA, France, Germany
- Special events; exhibitions; concerts; trade fairs: UK, USA, France, Germany
- National and international sporting events: UK, USA, France, Germany
- Contact telephone numbers for event organizers
- Over 4000 events in total from which to choose
- Useful Information Section provides weights and measures, conversion factors, time zones, international dialing codes and much more.

The program can also update other PIMs and desktop PC contact manager software, including Psion Agenda (3a, 3c, 5, Siena), Lotus Organizer97, MS Schedule+ v7.0a, MS Outlook97, and Act!v2.0. Annual updates available every autumn at reduced rate for subscription. Free password access to a web page with monthly details of changes

Windows® CE

Pilot, Geos, Newton & Zaurus

- ✓ Custom Development
- ✓ Messaging Applications
 - Virtual Courier™ – cc:Mail
 - MS-Mail/Exchange connection.
 - Exchange forms & Lotus Notes
- ✓ International Porting



MicroBurst, Inc.

15732 CRABBS BRANCH WAY, SUITE 200
ROCKVILLE, MD 20855
PHONE (301) 330-2995
FAX (301) 330-8609
E-MAIL: markf@mburst.com

Products

and new events. All products supplied on 3.5" PC format disks. Serial cable required for downloading from PC, H/PC or Psion.

Price: 12.95 UK pounds, \$19.50 U.S.

Use with: H/PC

Contact: On-Board Info Ltd. (U.K.)

Phone: +44 171 370 0307; Fax: +44 171 370 0870

Web: www.on-board-info.com

Launch Force

Lets you store as many as 10 frequently used applications in a tray icon. Tap the icon and a window appears with the icons of these 10 applications. Tap on the application icon to launch the program. Also lets you configure quick-start keys for each application.

Price: \$n.a.

Demo online from:

www.ruksun.com/wince/ or

www.pdacentral.com

PocketHoops

Designed to facilitate the recording, management and analysis of individual and team basketball statistics. Statistics may be recorded as they happen on the basketball court. Management and analysis of these statistics may be done using an ordinary Windows 95 PC.

Price: \$39

Use with: H/PC

Contact: Softscribe

Phone: 604-618-1977

Email: hoops@softscribe.com

Available through: www.mobilesoft.com

SmARTcommander

Add voice command capability to your PC Companion. Launch or open any application or file with a voice command. Have Pocket Outlook read you phone numbers, appointments, tasks and more. smART-commander recognizes any language, voice or accent.

Price: \$69

Use with: H/PC, Palm PC

Contact: Advanced Recognition Technologies (ART)

Phone: 888-ARTCOMP or 818-678-3999;

Fax: 818-678-3994;

Web: www.artcomp.com

StickyShift for Windows CE

It's difficult to hold the H/PC in one hand, hold down the SHIFT key and press another key to make a capital letter. StickyShift for Windows CE solves this problem. You simply press and release the shift key with one finger, then press the key you want shifted. StickyShift for Windows CE works inside almost ANY application. It's easily activated and deactivated. A small icon on the bottom of your screen lets you know StickyShift is working.

Price: \$19.95.

Use with: H/PC

Contact: Applian Technologies

Phone: 415-831-1499, Fax: 415-668-6668

Web: www.applian.com

(Orders preferred via web site)

Services

Communications

MobileCast two-way data communications solutions

MobileCast provides integrated Windows CE-based wireless two-way data communications solutions for the distribution industry. MobileCast uses Nettech's InstantRF wireless software and bundles dispatch and tracking software with mobile computing hardware, wireless airtime, installation, integration and support services. MobileCast allows distributors to receive ETA information throughout the day, accept new orders, anticipate and react to potential service delays, re-route drivers, and more.

Price: \$varies

Use with: H/PC, Palm PC, Auto PC

Contact: Roadnet Technologies

Phone 800-762-3638

Email: market@roadnet.ups.com

Web: www.roadnet.com

Web@Hand wireless business solutions

GoAmerica's Web@Hand wireless business solutions enable corporations to cost-effectively and easily outfit their mobile workers — from field personnel to account executives — with access to mission critical data and E-mail via corporate intranets and the Internet. GoAmerica runs a fully integrated suite of applications for RAM, CDPD, Ardis, GSM, and CDMA wireless data networks, and allows its customers to wirelessly-enable standard Web browsers such as Netscape or Microsoft Explorer version 4.0 using a wireless modem and Windows95 laptops, WindowsCE palmtops, ruggedized laptops, the PalmPilot, and other handheld devices and smartphones.

Price: \$varies

For use with: H/PC, Palm PC, Auto PC

For more information call 1-888-462-4600

Web: www.goamerica.net

Shareware/Freeware

Note: We apologize for not listing contact phone numbers, but we can rarely get them because most shareware and freeware is available online only. Where possible, we put the shareware and freeware mentioned on our Power CD (see page 45), and also at www.thaddeus.com

Communications

IrcCE

An IRC mail client for Windows CE devices.

Price: Freeware

Use with: H/PC

Web: www.geocities.com/Research-Triangle/9987/ or

www.pdacentral.com

Financial

Expense Force (alpha demo)

A simple expense tracking utility to keep an account of your daily expenses. Expense Force records your expenses in what we call an expense page. Each expense page has a name, password (if needed) and a base cur-

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rency. One could create an expense page for each month, or for each user using the H/PC, or for keeping track of expenses in foreign currency or simply whenever a need arises.

Freeware: (Demo alpha version)

Use with: H/PC

Available online at:

www.ruksun.com/wince

Suggestions & feedback: expenseforce-feedback@ruksun.com

Formulae 1

Formulae 1 Computer Algebra System for WinCE.

Freeware

Use with: H/PC

Available online at:

www.polipius.com/winproducts.htm

Games/Entertainment

Biorhythm

Figure out your biorhythms on the H/PC (Windows CE 2.0)

Shareware

Use with: H/PC

Contact: Benoît Huon (bhu@ezos.com)

Available online at:

www.ezos.com/Staff/bhu/bhuCEshareware.asp

bREADY Books for your H/PC

bREADY™ is required to view these books, and can be downloaded from the bsquare website. Each book is a collection of files — they should each be copied into their own folder on your H/PC. The following are available: Alice in Wonderland (zipped: 66k; Unzipped: 156k) Dr. Doolittle (zipped: 198k; unzipped: 412k) Shakespeare's Sonnets (zipped: 85k; unzipped: 141k) A Modest Proposal (zipped: 11k; unzipped: 21k) The New Testament (zipped: 490k; unzipped: 1,115k) Book of Revelation (zipped: 32k; unzipped: 73k).

Freeware

Use with: H/PC

Available online at: www.bsquare.com

Daughter In The Box

Japanese puzzle game.

Freeware

Use with: H/PC

Available online at: www.pdacentral.com

Martians

Updated for Windows CE 2.0 - Like in Space Invaders and Gorf, you have to kill the aliens before they kill you. As they shoot at you, your shields deteriorate until their lasers can finally hit you.

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Products

Shareware registration price: \$10.00

Use with: H/PC

Available online at:

www.xoanan.com/windowsce/

PalmMorse

Translates text strings to morse code quickly and easily.

Freeware

Use with: H/PC

Available online at:

www.zeode-sd.com/palmmorse/

PipeGame

PipeGame is a fast-flowing game of speed, strategy, and plumbing.

Shareware

Use with: H/PC

Contact: Benoît Huon (bhu@ezos.com)

Available online at: www.ezos.com/

Staff/bhu/bhuCEshareware.asp

PocketIndy

PocketIndy is the first 3D racing game for the Handheld PC.

Freeware

Use with: H/PC

Web: www.softscribe.com/PocketIndy.htm

Pocket Life

Windows CE version of the classic cell growth computer game. Watch cells grow and develop patterns.

Freeware

Use with: H/PC

Web: www.sticky.net.or

www.pdacentral.com

Sabotage

Updated for Windows CE 2.0 - The object of Sabotage is to stop the paratroopers from reaching the ground and stacking up next to your turret. If they stack high enough, they'll be able to blow up your turret.

Shareware registration price: \$10.00

Use with: H/PC

Web: www.xoanan.com/windowsce/

Tarot

Tarot card software for H/PC supporting Celtic Cross, Horseshoe and Nine Card. Available for Windows CE 1.x and 2.0.

Freeware

Use with: H/PC and Palm PC

Web: www.seanet.com/~fulcanelli/

Utility / Productivity

BugMe!

Put down notes and set an alarm so they pop-up on your screen to bug you about it.

Shareware registration price: \$15.00

Use with: H/PC

Web: www.hausofmaus.com/ or

www.pdacentral.com

CE Benchmark

Lets you measure your H/PC's performance.

Freeware

Use with: H/PC

Web www.pdacentral.com

Chat

Do you have boring meetings you have to sit through? Do you have a friend who goes to those same meetings who also owns a Windows CE device? Now you can chat over IR while looking like you're studiously taking notes!

Freeware

Use with: H/PC

Web: www.xoanan.com/windowsce/

Display Colors Applet

Change the color scheme on your Windows CE 2.0 device.

Shareware registration price: \$12.00

Use with: H/PC

Web: www.xoanan.com/windowsce/

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Dsoundm

Puts a volume control (with five different volume levels plus a mute capability) on the task bar of a Windows CE H/PC. The software comes in both SH-3 and MIPS versions.

Shareware

Use with: H/PC

Web: www.winceonline.com or
www.wincecity.com

EZTaskMan

Task Manager for windows CE 2.0. View and terminate Process; View, show, hide and close windows; View PCMCIA Status and driver.

Shareware

Use with: H/PC

Contact: Benoît Huon (bhu@ezos.com)

Web: www.ezos.com/Staff/bhu/bhuCEshareware.asp

LHA

Decompression utility for files compressed in the LZH format.

Freeware

Use with: H/PC

Web: www.pdacentral.com

Note Writer

Use the H/PC to write, organize and read notes. Each note has a title, category and date field, letting you find information quickly and easily.

Shareware registration price: \$34.00

Use with: H/PC

Web: www.iclsofttech.com/centrivex/ or
www.pdacentral.com

SnapIt Screen Capture

SnapIt takes great color screen shots on your Windows CE 2.0 device.

Shareware registration price: \$10.00

Use with: H/PC

Web: www.xoanan.com/windowsce/

StartY2000

StartY2000 adds on your owner ID start-up screen the number of days that are left before Year 2000.

Shareware

Use with: H/PC

Contact: Benoît Huon (bhu@ezos.com)

Web: www.ezos.com/Staff/bhu/bhuCEshareware.asp

Velo Performance Accelerator

Increase the performance of your Velo by at least 15% by allowing the CPU to access system ROM faster (Read Only Memory stores the operating system and built-in applications).

Freeware for Velo users, but you have to register with Velonet to get it.

Use with: Philips Velo H/PC

Web: www.velonet.com/

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Handwriting Recognition Software

By David Shier

Ever since Apple Computer introduced the original Newton PDA (Personal Digital Assistant), both the term PDA and handwriting recognition software in general have been the subject of much ridicule. So much so that Microsoft avoided both when introducing WindowsCE. Microsoft coined their own terminology for handheld computers, calling them Handheld PCs or H/PC. They also elected not to include any handwriting recognition software in the first releases of Windows CE, instead relying on third party software developers to fill in the gap.

The Challenge of Handwriting Recognition

Everyone knows that reading someone else's handwriting can be a real challenge. Sometimes reading your own handwriting can be even worse. Still, we're pretty good at it. In fact, we're a lot better at it than computers. They're great at handling objective data, such as finding a colleague's name in a contact list, or calculating the payments on a fully amortized loan. But humans have always proved more reliable at more abstract tasks like handwriting recognition.

If recognizing handwriting seems trivial, it's because we've been doing it so long, it's second nature to us. Actually, the ability is made up of a lot of sophisticated knowledge and skills. One is our understanding of the language we speak. For example, I am sometimes rather sloppy about dotting an 'i'. It can end up looking a lot like an 'e' (especially since I'm also careless about not keeping a loop out of it as well.) However, since I know that 'howivir' is not a word, I can distinguish an "e" from an "i" in the first

word of this sentence. Unfortunately, I can't always rely on the word alone. Both 'value' and 'valve' are words. If I'm not clear in writing my Vs and Us, then I may not be able to tell which one is correct. In such cases, I generally rely on the context of the sentence I'm reading, or sometimes the complete document, to provide clues to the correct letter in the word.

Makers of handwriting recognition programs face other challenges as well. One is that the program has to know when you're finished writing a letter or word. Even if you write legibly and consistently, the characters used in the English language are often ambiguous until you complete the letter or word. For example, a 't' and an 'l' look the same until I go back and cross the 't'. Thus, any handwriting recognition software must pause a bit after you lift the pen to see if you are going to add anything to the characters. In some cases, a program might interpret your writing immediately, and then go back and correct its assumption if you add a cross on a 't' or dot an 'i', etc..

Handwriting recognition programs must consider the order, speed and direction that you enter the strokes that make up a letter or a word. For example, 'c' and 'e' might look the same in a person's writing, but if you

watch them make the letters, they move the pen quite differently to form each letter.

Makers of handwriting recognition software have to consider the accuracy of the input device itself. Try using the stylus to write on the screen of your H/PC. You'll notice that the characters look like those written by a child who is just learning to write. The touch overlay on the screen has limited resolution. The result is that the subtle differences between two letters are often lost.

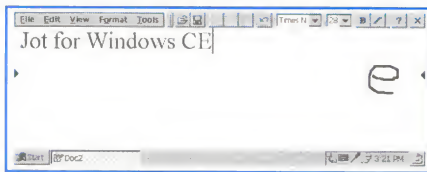
Finally, handwriting recognition software has a lot of characters to recognize. First, they have to recognize the common ways of writing the 26 upper case and lower case letters in the English alphabet. They also have to recognize numbers and punctuation (and the fact that a number of the punctuation marks are very similar – commas and apostrophes, for example). This is just the English alphabet. Other languages have more complexities.

All this knowledge has to be programmed into the handwriting recognition software. All these challenges lead to some unique and sometimes very clever solutions. Interestingly, the three handwriting recognition programs reviewed here each approach the problem in a very different way.

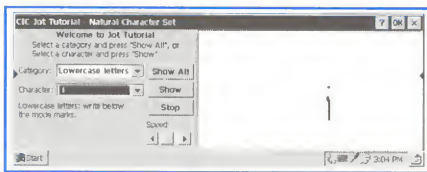


About The Author

David Shier is a former software engineer and marketing/sales director in the electronics industry. He is now President of Shier Systems & Software, Inc., which develops and markets products and applications for the handheld computer market. David is a regular contributor to *Handheld PC Magazine*. He can be reached at: Phone: 805-371-9391; Fax: 805-371-9454; E-mail: david@shier.com; Web site: www.shier.com.



Screen 1: Jot for Windows CE is shown here in a Pocket Word document. The two small triangular "Mode Marks" on the left and right sides of the display divide the screen in half. You draw numbers in the upper region, lower case letters in the lower region, and uppercase letters across the centerline.



Screen 2: The Jot Tutorial will teach you how to use Jot and the different ways you can draw characters so that Jot will recognize them.



Screen 3: smART Writer learns to recognize the way you write and lets you write printed characters (not cursive writing) anywhere on the screen.



Screen 4: smART Writer lets the user create a drawn image to represent a set of characters or words. (known as a "shortcut"). The writer draws the symbol and smART Writer enters the associated words. In this example, the happy face symbol is a shortcut for the words, "LOOKS GOOD!"

Jot for WindowsCE: a day-in, day-out workhorse

The highly successful PalmPilot relies on a special character set called "Graffiti" to simplify the task of handwriting recognition. The characters must be drawn a certain way and must be entered in separate locations to distinguish letters from numbers and punctuation.

Jot for Windows CE (from CIC) provides a similar method for entering characters. Like with Graffiti, you must draw each character a certain way and within a specific region of the screen (see comments on Jot in Palm PC review, page 14). Once you learn where and how, Jot is a very reliable handwriting recognition solution.

Jot displays two arrows on the left and right sides of the screen that mark the borders of the regions. You draw numbers in the upper region, lowercase letters in the lower region, and uppercase letters across the center so they are in both regions. You'll have to watch the screen at first to make sure you're in the right region (Screen 1).

Like most Windows CE programs and utilities, Jot is easy to install. I would have preferred a dialog that specifically asked me if I wanted to install the program on my Compact Flash card, but the install program gave me the opportunity to change the default directory. By manually entering \Storage Card\Jot I was able to install Jot on my Compact Flash card. Once installed, you must reset your H/PC. When the H/PC restarts for the first time, the Jot tutorial is automatically run. To avoid frustration, I recommend that you have a look at the tutorial at least once (Screen 2).

I was able to master character entry in Jot after only a few minutes time – with the exception of the letter "i." I kept making the stroke wrong and entering "ll" instead of "i." I took a closer look at the documentation and discovered a feature called Jot Trainer. Despite the name of the program, it doesn't train Jot to recognize your handwriting. Instead, it lets you select different ways to enter a specific character. It also tells you the consequences of your selections. For example, I used Jot Trainer to configure Jot to recognize a single vertical line as the letter 'i.' Jot Trainer let me know that I would have to write the letter 'l' with either an open loop or like an upper case 'L,' so that Jot could tell the difference between the two characters. This solved my "i" problem.

Jot provides a pop up entry window option in addition to the full screen for input. You can pop up a horizontal or verti-

cal window. You can also pop up a keyboard on the screen (similar to the soft keyboard described on page 18). While this feature is useful on the Palm PCs (where Jot is bundled as part of the system), I don't understand its value on an H/PC, with a perfectly usable mechanical keyboard below the screen.

A more useful feature is Jot's macro editor. This program lets you train Jot to input words, phrases or a limited set of commands. You enter a vertical stroke from bottom to top to start the macro mode, then enter the special characters, followed by a second vertical pen stroke. I used this to program lsssl to spell out 'Shier Systems & Software, Inc.'. The macro editor also allows you to use a very limited number of commands, such as cut, paste and date and time stamping. I would have liked a richer set of commands with the ability to input the ALT and CTRL keys, but unfortunately, none of the pen input programs provide such a feature.

I'm writing this review on my HP 620LX, while I sit in the passenger seat of a colleague's car. His Fiat bounces around the road as he speeds down the Italian Altostrati at 180Kph. I'm not able to keep my fingers on the keyboard, however, I am able to use Jot by writing big characters on the screen. This is giving me a real appreciation for Jot.

smART Writer: let the computer do the learning

Instead of making you write characters a certain way, smART Writer (from Advanced Recognition Technologies) learns to recognize the way you write characters, and lets you write them anywhere on the screen (Screen 3). This method has the advantage of allowing you to write in a more natural way, but you have to spend the time teaching smART Writer your way of doing things.

You train smART Writer via a "Quick Training" program that runs automatically the first time you use smART Writer. The program prompts you to write out some standard sentences like, "The quick brown fox jumped over..." Be aware that once you train smART Writer to recognize your handwriting, it will expect you to be fairly consistent in the way you write. If you're in a hurry and write something real fast (and sloppy) smART Writer might not recognize some of the characters. This might actually encourage you to write better. If you are consistent in the way you write, smART Writer should be very accurate.

Like Jot, smART Writer can only recog-

Handwriting Recognition

nize printed characters. Cursive writing is interpreted as a single symbol and can only be used for recording "shortcuts." The shortcut feature is similar to Jot's macro feature. smART Writer lets create a drawn image to represent a set of characters. I programmed smART Writer to enter my company's name when I write the double S pattern I use in my company logo. Screen 4 shows an example of this feature. A clever use for this feature would be to teach smART Writer to recognize and translate your signature into some random series of characters (such as: "pr^3bl;m\$1j@") that you use as the password for your private documents on the H/PC. While you most likely won't even remember this gibberish yourself, you can enter it with your signature — something that most others won't be able to duplicate. (If you use this technique, write this password down somewhere safe, in case you have to access the documents without the aid of smART Writer.)

An enhanced version of smART Writer includes a "digital ink pad" program, which lets you make and save drawings and handwritten notes (without translating them in characters). This program seems a bit redundant, given the fact that the CE 2.0 Contacts and Tasks applications have ink capability built into their Notes field. ART might make the digital ink pad more attractive if they made some additions to the program. For example, I would like to be able to move character and ink objects around and transparently overlay them. For example, I want to be able to draw a map and label the streets with characters. As it is, if the background of the words crosses the lines of the map, the map is moved behind the words and is lost. (Sort of like cutting and pasting pieces of paper on top of each other instead of writing on clear plastic that can be layered without obscuring the background.)

Finally, smART Writer doesn't require a lot of memory to store or run. This is an important consideration on first generation H/PCs with limited RAM. ART also produces the smART Command voice recognition software for Windows CE.

CalliGrapher: handwriting recognition on steroids

The previous two programs require some form of training: either you have to be trained to learn the program's character set (as in Jot) or the program has to be trained to learn yours (smART Writer.). CalliGrapher (from ParaGraph Technologies) needs no training. In fact, at a

user's group meeting, I passed around my H/PC and everyone was able to input text on the same machine — except the one guy with writing that was so bad that he admitted he often can't read it himself!

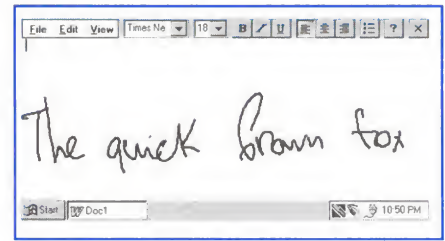
But this capability comes at a price. CalliGrapher is huge: taking over 3/4 of a megabyte of storage space, plus a similar amount of system RAM memory when the program is running! It's also slower than the other two programs, taking up to two seconds to interpret input, even on my fast HP 620LX. This means that CalliGrapher is not a real option on machines with less than 6MB of memory.

CalliGrapher can read both printing and cursive writing, but believe it or not, it generally works best on cursive (Screen 5). CalliGrapher uses a dictionary to help it decipher words that it can't quite figure out. This is one of the reasons that it works so well (Screen 6 & 7).

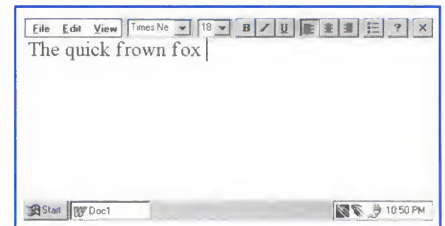
The program is rich in features. There are so many taskbar icons available, that if you turn them all on, you almost need a wide screen H/PC to see them all. For example, you can change the orientation of the machine during recognition. This means that you can rotate the H/PC 90 degrees and write across the screen, or even set CalliGrapher to recognize characters with the machine upside-down. As crazy as this sounds, this feature can be useful to get the keyboard out of the way.

CalliGrapher also lets you create and save digital ink. Unfortunately, as with smART Writer, the features of the drawing program are so minimal that this feature is not of much value. CalliGrapher lets you defer the recognition — saving the input as ink and having CalliGrapher interpret it later. Given the small writing area on the H/PC's display, you really can't get much writing in one screen full. I don't see how this feature would be more useful than immediate character recognition.

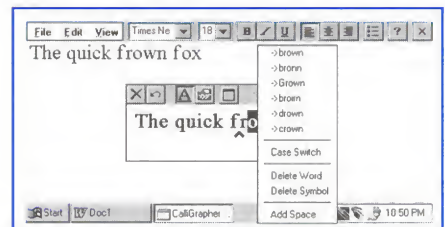
Another interesting feature of CalliGrapher is called IntelliCalc. This feature lets you perform simple mathematical operations just by writing a formula. If numbers and arithmetic operators (+, -, *, /, %, .) are followed by an equal sign, CalliGrapher will recognize the formula and provide the results. So if you write "3.23+2.57=" you will see: "3.23+2.57= 5.80". Calculations are performed on numbers with up to two digits after the decimal point and 7 digits before it. The result is limited to the same range. This makes this feature useful for currency calculations, but not much else.



Screen 5: CalliGrapher can read both printing and cursive writing. This shows how the Pocket Word screen looks after you've entered the words, but before CalliGrapher has deciphered them.



Screen 6: This shows the Pocket Word screen after CalliGrapher has deciphered the words. Note that it made a mistake, entering "frown" instead of "brown."



Screen 7: You can use CalliGrapher's pull-down word replace feature to correct any mistakes it makes.

Which one's for you?

Each of the handwriting recognition programs should find their own fans: I would recommend Jot for those who need handwriting recognition on a regular basis. smART Writer seems more practical for more occasional users who don't want to have to learn to write differently than they normally do. Finally, for uses of newer H/PCs with lots of memory and processor speed, CalliGrapher is a safe bet. ■

CalliGrapher 5.0 — \$49.95 Contact: ParaGraph International; Phone: 650-933 3000; Email: info@paragraph.com ; Web: www.paragraph.com.

Jot for Windows CE — \$49 Contact: Communications Intelligence Corporation; Phone: 800-888-8CIC or 650-802-7888; Fax: 650-802-7777; Email: sales@cic.com; Web: www.cic.com.

smARTwriter CE PLUS — \$69.95 Contact: Advanced Recognition Technologies; Phone: 818-678-3999; Email: sales@artcomp.com; Web: www.artcomp.com.

One day at a time... with my H/PC

By Bil. Alvernaz
bil@cyberlynk.com

6:15 a.m.

— I get back to the room after exercising and the red light on the phone is flashing. I check messages and make a quick call to a client in New York. After hanging up, I make notes in the client file I keep on my H/PC. Then I connect the H/PC modem to the phone line and check my email (I can access MCI Mail via an 800 number from anywhere in the United States). I send two faxes (another nice feature about MCI Mail) and I'm done.

7:30 a.m. - After my shower, room service shows up with my breakfast. While eating I make entries to my "Food Log" spreadsheet. This is where I keep track of what I eat as well as the calories burned during my daily workouts. I've never had a weight problem and I don't ever intend to! The H/PC's spreadsheet makes it effortless to track all of this, and knowing I have to make daily entries helps me "toe the line" while traveling or at home.

8:00 a.m. - I make three calls, none of which I dial — I let my H/PC do that for me. Using PhoneTone, I can automatically dial phone number from my Contacts list (which I keep synchronized with Outlook97 on my desktop PC). It's great to just hold the H/PC's speaker up to the phone and hear everything dialed in for me, including my phone credit card number! I have a little time for post cards before I have to leave. Once again I open up my H/PC, this time to look up the addresses and check my notes to see who should be getting a post card.

11:00 a.m. - While waiting in the airport, I go over notes on a presentation I will

be making that evening in Las Vegas. While I'm doing this, four different people come up to me and ask me about my H/PC. This happens so often that I've developed a little presentation describing why I'd rather be dead than without my H/PC. First, I point out how easy it is to get through airport security with the H/PC (as opposed to lugging a laptop or any other type of computer). Then, I go through the basic features and conclude by showing them how easy it is to use the "teeny tiny" keyboard! Most people are pretty good about taking a quick look and then leaving you alone to finish your work. Today, no one lingers, so I get back to my presentation notes. I keep them in a program called ListPro (see review, page 54). It lets me arrange them as a checklist of points, and rearrange and delete points as necessary. It makes creating presentations (or any kind of list) a breeze.

11:25 a.m. - They make the announcement that my flight is delayed. I open up my H/PC and start working on this article for Handheld PC Magazine.

12:30 p.m. - I split a gigantic pizza with four other wayward passengers from my delayed flight (it's cheaper and more fun that way). I pick up the check, take out my H/PC, and run a little program called Tipster.

Tipster is a simple program that adds in a tip and then divides the total by the number of people paying. The others are amazed that the H/PC can do something so clever!

4:00 p.m. - We're finally in the air. Just before I got on the plane I use PhoneTone again to dial the call to my contact in Las Vegas to let him know I would be coming in

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for Windows CE



About The Author

Bil. works as a consultant and writer for a wide variety of companies. He has written for USA Today, PC Magazine and other trade publications. Bil. is a host on Microsoft Network's Windows CE Forum, helping people learn the ins and outs of working with Windows CE Units. He also manages the Windows 95/98 Forum on MSN.

One Day At A Time

late. All total, the plane was delayed over three hours, but thanks to my H/PC, the time I spent waiting for the flight wasn't lost. I keep a 10 Megabyte PC storage card with me and can carry just about all the data and

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information I need. I was able to get ALL of my work done, including catching up on my expense report that I keep in a Pocket Excel spreadsheet. I had enough extra time left over to start a short story I plan to enter in a contest Story Magazine is sponsoring. What otherwise would have been lost time turn out to be extremely productive.

The guy in the seat next to me had waited with me all afternoon in the airport. He'd seen all I had accomplished with my H/PC and was impressed. I decide to show off my H/PC a little more. I open up my briefcase and take out the TeleType Global Positioning System (GPS) receiver I've been testing. The GPS receiver tracks where you are, using satellites. The TeleType unit slips into the H/PC's PC Card slot and turns the H/PC into a portable GPS unit. I show this guy exactly where we are on a map, and point to a readout that shows our latitude, longitude, height above sea level, speed and the direction we are going. This system can be used by pilots, mariners, and others who need to know where they are. It's really a kick to see exactly where you are while flying cross country at 33,000 feet.

After the snack is served, I was ready

for a little fun. I especially like Dot-2-Dot from the GameBag One games package. Dot-2-Dot is a maddening little game where you connect dots to make squares. The "built in" opponent is really, really good and most often makes the most squares (which is the object of the game). However, on this day, I did manage to win (how, I'll never know!).

7:00 p.m. - I made it to my dinner presentation in Las Vegas and everything went just fine. I used Microsoft's Pocket Automap Streets to find the hotel. It's zoom feature is handy, letting you zero in on the location you are going and show additional detail. No more folding maps!

Postscript, two days later

Once I got home, I immediately connected my H/PC to my desktop PC. I copied to my desktop the Pocket Excel and Pocket Word documents I worked on while I was away. I had made changes to my H/PC's Calendar and Contacts applications and my wife made changes to my desktop PC's Outlook program. All were synchronized. Finally, I transfer Contacts changes to my Timex DataLink Watch. It's a time piece with a tiny personal information manager built in, and I keep important phone numbers on it, for the odd chance that I'm separated from my H/PC. ■

MCI Mail is a service of MCI; Phone: 800 444-6245

PhoneTone, Tipster, ListPro and Gamebag One are all product of Illium Software; Phone: 888 632-5388 or 313-973-7761; Fax: 313-207-9358; E-mail: info@iliumsoft.com Web: www.iliumsoft.com

TeleType GPS is a product of the TeleType Company; Phone: 617 734-9700; Fax: 617-734-3974; Email: gps@teletype.com Web: www.teletype.com

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CompuServe e-mail in the H/PC Inbox

CompuServe recently changed its mail server so H/PC users can directly connect to CSI and download their email. Here's how you do it!

By Don Hergert

For almost a year, handheld PC users have been asking CompuServe (CSI) for a way to be able to use their Windows CE Inbox to connect to and get CompuServe email. The problem was that CSI's POP3 email service required a special layer of security called Remote Passphrase Authentication (RPA), which is not supported by Windows CE. Many H/PC users had their CompuServe email forwarded to another Internet Service Provider and picked it up there.

CompuServe has recently solved this problem by changing its POP3 (Post Office Point to Point Protocol) mail client so that the RPA layer is no longer required. This makes it usable by the Windows CE Inbox POP3 mail client (and other palmtop users). CompuServe's new email service is now available to all members; and just in time to support the Windows CE 2.0 Inbox with its attachments capability.

Setting up the H/PC and CompuServe to work together is complicated by the need to do part of the setup using a Web browser on a PC running Windows 95/98/NT. This set of instructions assumes that you already have an Internet Service Provider (CompuServe or another provider) and have already set up your PC and H/PC to work with it. It also assumes you are a CompuServe member.

Create a CompuServe POP3 mailbox from your desktop PC

Use your desktop PC's web browser to go to CompuServe's web page at: www.csi.com/communications. (Windows CE's Pocket Internet Explorer will not do here — you must use your Windows 95/98/NT desktop PC.) Follow the instructions and

prompts for creating a POP3 mailbox. Make sure to create a mailbox password — create a "clear-text password" that Windows CE can support (see sidebar).

Also note that this site provides you with the option of changing your User ID to something more readable than the traditional numeric CompuServe User ID. Make sure to read through CompuServe's dialogue about other changes which may occur as a result of changing your User ID.

When you're done, CompuServe's web site will display a box with the settings you need for connecting to POP3 email. It will look something like this:

Please configure your mail client with the following information:

Email Address:	dherg@csi.com
Incoming Mail (POP3) Server	pop.site1.csi.com
Outgoing Mail (SMTP) Server:	smtp.site1.csi.com

After configuring a CompuServe POP3 mailbox, CompuServe's web site displays a box with information you'll need to configure your H/PC's Inbox.

Print these out or write them down, along with your mailbox password (and your email User ID if you've changed it).

WARNING: If you choose to redirect

your CompuServe email to this mailbox, remember that you won't be able to read your email from WinCIM or other CIM products any more (unless you un-redirect it).

Set up your H/PC

1. Open Inbox on your H/PC, tap Service from the Menu bar and select the Properties option. You are presented with the first of three screens used to set up your Internet Mail Service definition. If you have a Windows CE 1.0 H/PC, the screen will be titled: "Service Definition for: Mail (Step 1 of 3)." If you have CE 2.0, it will be titled: "Internet Mail Service Definition (1/3)."

[NOTE: If the Properties option is grayed out and won't open, you will have to go through the process of installing Internet Mail Service before you can define its properties. To do this, go back to the Menu bar and select Compose. Select Options, then the Services tab and tap on the Add button. From the Services list, tap on Internet Mail and hit OK. Give the service any name and tap OK again. This takes you to the Service Definition screen mentioned above.]

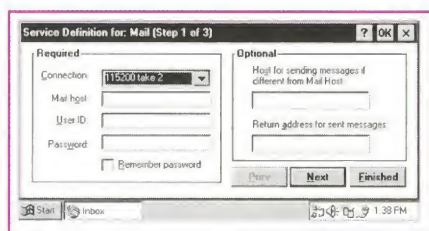
2. Fill in the Service Definition screen as follows:

Connection — Select the desired con-



About The Author

Don Hergert lives with his family in Southern California and is a senior programmer analyst at Loma Linda University Medical Center. His specialty area is data communications and enterprise interface engine technologies in the health care setting. He has been a user of handheld computers since 1980. Don can be reached at 72235.32@compuserve.com



The Service Definition screen is accessed from Inbox's Service menu. You use it to tell Inbox how it should connect to CompuServe. The screen shown above is from the Windows CE 1.0 version of Inbox. It is slightly different on Windows CE 2.0 H/PCs.

nection from the pull-down list.

Mail host (labeled POP3 Host in Windows CE 2.0) — Enter "pop.site1.csi.com"

User ID — Enter your CompuServe user ID, minus the "@csi.com"

Password — Enter your mailbox password

Remember password (labeled Save password in CE 2.0) — Check this box and you won't have to enter your password each time you get your mail.

Host for sending messages (Labeled SMTP Host; in CE 2.0) — Enter "smtp.site1.csi.com"

Return address — Enter your CompuServe user ID again, this time with the "@csi.com" at the end

3. The next two screens let you set General Preferences and Inbox Folder Preferences. You can leave them as they are and tap Finished.

You're all set!

Now you're ready to pick up your CompuServe email on your H/PC

1. Connect your H/PC to your modem.

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CompuServe's New Email Service

Remote Passphrase Authentication (RPA) is a security layer that used to be in place in CSI's POP3/SMTP email service as the one and only security method through which everyone had to pass to get their email. It's a good security system, supported by most Win95/NT4 POP3/SMTP email client programs. However, WinCE's Inbox program does not support it!

In order to make its POP3/SMTP email service work for Windows CE users, CSI created a new security system which uses a "clear-text password" which is a simple ASCII text word or group of characters designed exclusively for the email service. Windows CE's Inbox program does support this type of security method, and so we can use it to access CSI's POP3/SMTP email service.

Implied by the name "clear-text password" is the fact that this password is not a secure password over the Internet. Anyone on the Internet using sniffing tools on this connection could view this password being sent to CompuServe in "clear text" and could potentially access this user's mailbox maliciously — something they could not do with the RPA system.

For this reason, CSI users should change this special password frequently, and most of all, they should not use their normal CSI password for the CSI POP3/SMTP email service.

2. Then connect to your Internet Service Provider. You can do this in one of three ways:

- Tap on the Remote Networking connection icon you created when you set up your H/PC for an Internet Service Provider.

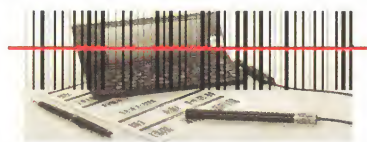
- Start Inbox, tap on the Service menu and select the Connect option, which will start up your Remote Networking connection to your ISP automatically.

- Start Pocket Internet Explorer, which will start up your Remote Networking connection to your ISP automatically

3. If you're not already in Inbox and connected to the CSI POP3 email service, start Inbox and do the Service 3D > Connect now. When Inbox first connects it will check for email. If you wish to repeat that process afterward while running Inbox, do a Service Refresh.

This should do it for you. CompuServe's next big step is to move its Information Service content to a Web browser format. Many of CompuServe's Windows CE users are really looking forward to this because they will be able to use Pocket Internet Explorer to browse around

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PowerCD **Handheld PC Magazine** **May/June 1998**

Windows CE shareware and freeware mentioned in this issue and available on our PowerCD supplemental CD ROM and at our website: www.thaddeus.com

Program	Description (shareware/freeware status)	Page No.
Biorhythm	Calculate biorhythms on the H/PC (Shareware)	35
bREADY Books	Books displayed by bREADY (Freeware)	35
BugMe!	Notes pop up on H/PC; you sent date/time (Shareware)	36
CE Benchmark	Measure your H/PC's performance (Freeware)	36
Chat	Pass notes between H/PCs via IR port (Freeware)	36
Daughter in the Box	Japanese puzzle game (Freeware)	35
Display Colors	Change color scheme on H/PC (Shareware)	36
Dsoundm	Adds volume control to Taskbar (Shareware)	37
Expense Force	Expense tracking utility (Beta demo)	34
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PalmMorse	Translates text to morse code (Freeware)	36
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The Holy War (John Bunyan); *The Blue Lagoon* (H. de Vere Stacpoole); *The Song of Roland* (translated by Moncrieff); *Ballads and Vailima Letters* (Robert Lewis Stevenson); *The Redheaded Outfield* (Zane Grey); *The Lost Prince* (Francis Hodgson Burnett); *The King's Jackal* and *Soldiers of Fortune* (Richard Harding Davis); *Penrod* (Booth Tarkington); *Helen of Troy* (Sara Teasdale); *Four Poems* (John Milton); *The Vital Message* and *Round the Red Lamp* (Arthur Conan Doyle); *The Master Key* (Frank Baum).



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By Tom Gibson

Technical Editor, Handheld PC Magazine

Email: tom_gibson@thaddeus.com Web site: www.thaddeus.com

COMDEX and CES have come and gone and with them some new and exciting things in the Windows CE world. The Palm PC and Auto PC were both introduced at CES and by the time you read this, at least two of the Palm PCs will be shipping (Casio and Everex). In this issue we'll take a look at web sites of interest to Palm PC (and H/PC) users.

Microsoft and the Palm PC Manufacturers

www.microsoft.com/windowsce/palmpc/

Every journey must start at the beginning, so we will start at Microsoft's Palm PC site. You can take a look at the features of the Palm PC, go to a Frequently Asked Questions (FAQ) page, and link to the web sites of Palm PC manufacturers. If you want to know anything about the Palm PC, this is the place to start.

www.casiohpc.com/index.html

Casio has announced that they will ship the Cassiopeia E-10 Palm PC in late April. There is not yet a lot of information on the site about the E-10, but there is a press release about it and a contest you can enter to win an E-10. Keep your eye on this site for more information about the E-10.

www.everex.com/

Everex has also announced a late-April shipping date for its Freestyle Palm PC. The Everex site provides more information about the Freestyle. They have included specifications of the Freestyle along with the press releases.

www.palmax.com

The Palmax site doesn't yet have a lot of information about the PD-300. They mention that they have targeted April 1998 as a release date of their Palm PC. There is a press release and a specification page that tells us the PD-300. The site was very slow when I visited, hopefully thing will speed up at Palmax.

nino.philips.com/

The Philips Palm PC web site describes the product and lists press releases. At the present time, you have to register with Philips on the site to view any information or pictures. Philips announces that the Nino 300 will ship in the 2nd Quarter 1998.

The other OEMs that have announced that they will have a Palm PC Product are LG Electronics (www.lgphenom.com/), Samsung (www.samsung.com/), and Uniden (www.uniden.com/) however none of them have any information at this time on their web sites.

Palm PC user web sites

While the manufacturers should have information about their products, it is often the web sites run by users that give us the best information.

www.craigtech.co.uk/palmpc/

Craig Peacock continues his fine work in the Windows CE realm with the addition of a Palm PC page on his website. Craig has links to the manufacturers and also has a chart listing the Palm PCs that have been announced along with the known specifications.

members.xoom.com

Elizabeth Reid Steere has a nice page that is split into two sections; one for Handheld PCs and one for Palm PCs. Elizabeth has pictures of the Palm PCs that exist and lists their features.

personal.cfw.com

Blake Patterson has put up Blake's Nino Information Page, which includes a number of articles about the Nino and a discussion of the input method. He includes links to other Palm PC sites. This is a very nice site, especially if you are interested in the Philips Nino.

www.pierce.aci.on.ca

Brent's Palm PC Site is another nice Palm PC web page. Brent has pages for specifications, pictures of Palm PCs and a guest book along with links to other Palm PC and H/PC sites.

Sites with freeware and shareware

There are other sites out there that don't quite fit into the manufacturer or user site categories. They're worth looking at because you'll find a lot of freeware and shareware for Windows CE devices.

www.palmpc-underground.com/

Palm PC Underground is a new site that promises to give us software, and information dedicated officially to the Palm PC market. There isn't much there now as the first Palm PC hasn't been sold yet, but I'll keep an eye on it and let you know when there is.

www.pdacentral.com/

PDACentral is a new shareware/freeware site on the web that has sections for the Pilot, Newton and Windows CE devices. It is brought to us by the folks at TUCOWS, one of my favorite sites for getting freeware/shareware for my desktop PC. I expect that PDACentral will be the same.

www.hpc.net/

HPC Net has been around for a long time and is still going strong. These are also the folks who host the Windows CE-Talk mailing list and they have lots of freeware and shareware for the H/PC along with news articles and links. I expect they will have a lot of stuff for the Palm PC. This is definitely a site to add to your Favorites.

The Palm PC market is coming alive and there are new sites going up all the time. I'll keep you posted.

Until next time, happy browsing and I'll see you Online! ■


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Up for Some Magic!

Back around 1993 and 1994, a small company called General Magic was the talk of both Silicon Valley and the then-emerging world of handheld computing. This once highly secretive company, headed by some of the brightest engineers and marketing talent around, had just introduced a handheld operating system that they hoped would change the world.

Dubbed Magic Cap, the system packed a lot of technology behind a user interface that many thought showed as much originality as the Macintosh nearly ten years earlier. And embedded deep inside the system was an even more innovative piece of software called Telescript, a language for building and managing advanced software agents capable of doing useful work for people connected to a network.

Of course, most everyone knows what happened to General Magic. In many ways, the technology was simply too far ahead of its time. And by the time similar ideas turned up on the Internet and Web, it was too late to save the architecture. But all was not lost.

By now, you must be wondering why I choose to write about them in a magazine about Handheld PCs. As it turns out, General Magic didn't just roll over and die. It successfully regrouped and set itself the task of tackling mobile information management from a fresh perspective. And this is where Microsoft and Handheld PCs come in.

Recently, Microsoft surprised the handheld world by licensing some technology from General Magic, as well as making an equity investment in the company, both totaling no less than \$6 million. What does General Magic have that Microsoft wants? Neither company is willing to get specific. In fact, the terms of the agreement preclude them from revealing precisely what Microsoft has licensed.

However, by looking at General Magic's recent efforts, we can build a reasonable picture. In a word, I believe Microsoft is interested in the technology behind "Serengeti." Serengeti is General Magic's code name for a voice controlled, intelligent virtual assistant. In a nutshell, Serengeti is a network-based personal information manager that enables you and others to manage, synchronize, and prioritize time critical business information using either a telephone (including a cellular phone), a desktop computer, or an H/PC.

What's so magic about Serengeti? Kevin Surace, vice president and general manager of the Products and Network Solutions Division explained it to me. "When we looked back about a year and a half ago, we looked at what the company had done and began to consider how we could deliver information to mobile workers without requiring them to buy a new device."

"So the question became, how could you put all this intelligence into a network and system, and deliver all of a person's public, private, and custom information to them, wherever they are, with whatever device they already own. And so the focus quickly became developing a state-of-the-art voice user interface design."

According to Surace, this would enable people to utilize cellular phones, landline phones, and everything else that they're already comfortable using. "We would thereby get away from the objections of 'it's too big, it's too heavy, it's too expensive,'" said Surace. "That would be gone because

this service wouldn't weigh anything."

General Magic designed the service, according to Surace, by literally following CEOs and vice presidents around to see how they get their information during the day, and what that information was. "It turns out that almost all those people got their infor-

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ABOUT THE AUTHOR

John Jerney is editor of the seven-year old industry newsletter "Pen-Based Computing: The Journal of Stylus Systems", www.penbased.com, and the Web-exclusive monthly "mobilis: the mobile computing lifestyle magazine" available at www.mobilis.net.

mation not via technology," explained Surace, "but via a cellular phone and a human assistant or two back at the office. So they would literally call another person, and that person would have access to all that information. And this person would convey all this information over the phone."

That information included items such as important email, voice mails, faxes, and so on. It also included news information such as their company's stock price, information about their competitors, what was going on in the market, and more. It certainly included their calendar, as well as handling all their inbound and outbound calls.

This caused a giant light bulb to go on over the General Magic building in Sunnyvale, California. What if they were able to reproduce this system for the 98 percent of mobile professional that aren't able to rely on a human administrative assistant? And that's precisely what the company has done with Serengeti.

When Surace talks about Serengeti, you often hear the words "human" and "her" intermixed with explanations about how you interact with the system. "We've focused on developing a very 'human' interface," said Surace. "You speak to 'her' no differently than you'd speak to a regular assistant, albeit perhaps more aggressively because 'she' doesn't get very mad at you."

For example, you could say "Serengeti, could you get my important messages?" And the system may respond "Yes, you have five messages, and three of them are important. Here's your first email...Here's your next voice mail..." To this, you may respond, "OK, delete that, forward the email, and I would also like to reply to this email."

"You can do all this," said Surace, "then add new appointments, reschedule others, and check upcoming meetings. In the meantime, 'she's' answering the phone for you, letting you know if someone is on the line, and finding you wherever you are. In other words, we've tried to make the system so human-like that there's nothing to learn since these are things you already know how to communicate."

Of course, you're not limited to accessing the system via General Magic's Voice User Interface (VUI). The system is also fully accessible via the Internet, using any computer with which you can browse the Web. "If you just want to go to the Web site using the

handheld, and it's equipped to do so, then that's possible," explained Surace.

All the while, the system is busy synchronizing with your desktop-based contact and groupware applications, ensuring that when you do contact Serengeti, you're presented with the most up-to-date information available.

The most innovative part of the system, and the part in which, I'm guessing, Microsoft may be particularly interested, is the VUI. "We have, combinatorially, a few hundred thousand phrases you can say to the system," said Surace. "For each sentence, we scan essentially for a beginning, middle, and end, and we look for matches. This means that you can speak very naturally saying, for example, 'Serengeti, can you find Kathleen Page's phone number?'"


Surace says that you don't have to learn a vocabulary, because they've tried to include everything that you would likely ever say. "What we've done is listen to real

users, and what they say, and coded that into the system."

General Magic intends to offer this service themselves, powered by a network operations center capable of scaling to hundreds of servers and supporting more than 500,000 users. "We provide the service at all times. And as a service provider, we could offer these services to other communication companies, who in turn could resell it to end-users," said Surace.


Sounds interesting, doesn't it? I believe Microsoft thinks so as well. The implication to H/PC users is that critical business and contact information no longer needs to be cloistered on your desktop computer, waiting for you to synchronize before-you-go. Serengeti promises to offer you access to this information from anywhere you can dial a phone or access the Web. I guess General Magic may just have some pretty cool tricks left up its sleeve. ■

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Andrew Seybold

Windows CE and Wireless Communications

Today, Windows CE devices in three flavors have been announced — Palm PC, Handheld PC, and Auto PC. Microsoft has further stated that there will be more Windows CE devices in a variety of form factors including larger mobile computers, “smart phone” devices, and products for the home or entertainment markets.

According to Microsoft, Windows CE devices are designed as “PC Companions.” In order to take full advantage of these devices, you have to use them in concert with at least one PC. Their real value is not that they permit you to store your calendar, phone book, databases, and files, but rather that you can synchronize the information on your Windows CE device with your desktop or mobile PC.

For this reason, Windows CE devices need to be able to “talk” to their host system or systems to exchange information. The communications link can be established with a cable or via the infrared communications capabilities built into the systems.

The problem with infrared communications

Infrared communication is of value when two PC Companion users want to exchange information and are within a few feet of each other. You can also use it to communicate with a desktop PC equipped with an IrDA infrared port. I use an IR connection for my data synchronization.

IR communication has been standardized by the IrDA organization, and it is available at speeds up to 4 Mbps (megabits per second), although the most common speed for Windows CE devices is 115 bps. While it is a standard, few if any desktop computers have IR ports built into them.

This is the key problem with IR communications. The cable for connecting the PC Companion to the PC comes with the device. But in order to be able to send and receive data via IR, the user will most likely need to buy an infrared port and install it on the desktop.

Communications away from the desk

I have stated many times that I believe that as H/PCs, Palm PCs, PalmPilots and similar devices become more popular, there will be an increasing demand for communications links between users companion devices and their own information sources, usually their desktop computer. Are computer and communications industries prepared to respond to this demand?

So far, most of the computer and communications companies are more interested in providing access to the Internet and “news, weather, and sports.” These companies are providing wired and wireless access to the Internet as a “pull” technology where users go to the Net and “pull” information down to their device, and a “push” technology where information is “pushed” out to the user (e.g., AirData’s News, Weather, and Sports).

However, there are some encouraging signs and activities in this space. Palm joined with Motorola and PageMart to provide a one-way paging module that slips into the PalmPilot and does not spoil the form factor. More importantly, they did an

excellent job of integrating the paging operating system with the Palm OS to provide calendar synchronization, calendar look-up,

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ABOUT THE AUTHOR

Andrew Seybold heads a computer and communications industry consulting and newsletter company, and publishes the well-respected Andrew Seybold's Outlook on Communications and Computing. He has an extensive radio communications and computer background, is recognized as one of the top analysts in these fields, and is a founder and President of the Portable Computing and Communications Association (PCCA). Andrew Seybold's Outlook can be reached at 408-338-7701, fax 408-338-7806, e-Mail lseibold@outlook.com

and other features that make the Palm Pilot/Pager combination more than simply a PalmPilot and a pager.

They have also provided software that resides on the desktop that can "push" calendar and other information out to the Pilot on a user-specified basis, making the system even more valuable.

Starting with one-way communications

Palm PC products will also have one-way paging capabilities, but it remains to be seen whether the first offerings will include desktop "push" capabilities. If news, weather, and sports is all users can receive on their Palm PCs, the companies that have sunk money into such projects will learn a costly lesson about what this class of users really wants.

I assume that there will be some one-way wireless services that will provide useful information for Windows CE users and that one-way wireless devices will sell relatively well during the balance of 1998 and beyond. One-way messaging makes sense for large fleets of users that need pricing updates, product change notifications, etc., as long as they can access a phone for wired connectivity several times a day for more extensive downloads and two-way communications.

The real promise

The real promise of mobile communications for Windows CE devices will be realized through two-way wireless modems. While today's two-way wireless modems make use of the PC Card slot or a serial port on the mobile device, newer wireless modems will be built to fit into the CompactFlash slot provided on Palm PC and Auto PC products.

Using today's PC Card wireless modem technology, you can connect via wired circuits, analog cellular, digital cellular, PCS, ARDIS, CDPD, and RAM. Using a serial cable, you can make use of Metricom's Ricochet network or SkyTel's two-way paging network.

Wireless modems are available, wireless services are available, and Windows CE 2.0 supports remote synchronization. One might think that it is easy and economical to make use of a wireless network with a Windows CE device today – it is NOT!

Types of networks

Let's look at wireless dial-up networks first. It is safe to assume that you can do anything with a wireless dial-up modem that you

can do with a wired dial-up modem. Any information you can access while wired you will be able to access wirelessly. The reason is simple. Except for some special protocols and error-correction software, wireless modems function just like wired modems.

Today, you can purchase a PC Card wireless modem for cellular (AMPS), GSM PCS, (or the Ricochet system if you are in one of the three metro areas Metricom serves). Using a dial-up wireless modem is just like using a wired modem except that the cable from the PC Card attaches to your handheld phone instead of an RJ-11 jack in the wall. Because these modems are powered by the host device, they can quickly drain the H/PC's batteries. However, when the H/PC is plugged into an AC adapter, this isn't a problem.

Once set up, you can dial just as you would with a wired modem. If you can dial directly into your desktop using a wired modem, you will be able to do so using a wireless modem. If you dial into a corporate modem pool, you will have this capability as well.

Cellular or PCS wireless modems provide slower access speeds (9600 bps typically), and you pay the same per-minute rate for wireless data as you do for wireless voice. The Metricom system is faster and uses an external wireless modem with a built-in battery and a flat monthly charge which usually includes Internet access.

Other wireless services

The most practical types of wireless access to and from Windows CE devices are provided by wireless packet-data services and SkyTel's 2-Way paging network. ARDIS, CDPD, and RAM Mobile Data are data-only packet-based networks. ARDIS and RAM provide coverage to more than 90% of the business population of the U.S., SkyTel's network covers less, and CDPD systems cover about 50%. None of these networks are considered fast (average throughput is in the 10-Kbps range), and none are designed for "surfing the Net" in graphics mode. However, for synchronizing calendars and receiving and sending e-mail, these networks are ideal.

ARDIS, RAM, and some of the SkyTel two-way paging service options offer free in-coverage roaming. No matter where you are within the ARDIS network, for example, when you turn on your wireless modem you are automatically registered on the network and any messages being held for you are sent to your device. These systems are so "smart" that if they are sending you a mes-

sage when you turn off your device, get on a plane, and fly to another city, they know you didn't receive the message in its entirety. When you turn your device back on in the destination city, the message is automatically delivered to you.

If all this is here

The question now has to be that if these networks are in place, and if there are wireless modems available for them, why aren't they teeming with customers? The answer is complex; but simply stated, it is (1) because these networks are perceived as being too expensive for general use, and (2) connecting the handheld device back to users' own desktops via a wireless data network is no simple matter.

It should be easy to walk into a store and buy a wireless modem, sign up for service over a network, and connect directly back to your own desktop system. Unfortunately, the communications industry has not focused on this type of connection. They have become accustomed to providing a pipe over which we can access people who have a specific address: a phone number. They do not understand that this model does not work in the world of data. When the issue of desktop access arose, they said, "Internet! All we have to do is to provide a connection to the Internet and the user can connect to anything! WRONG!

Because the Internet is a public network, corporate IS managers install firewalls so that people on the outside cannot access the information on the inside. This means that a wireless link to the Internet cannot provide access to users' own desktops or LAN-based information. Thus, the wireless connection is of no great use to them.

The solutions

The good news is that many companies on both the computer and communications sides of the fence now recognize the importance of providing end-to-end communications links between mobile devices and users' own information sources. Resources are being applied to solving the security and connection issues, and I believe that we will see several solutions emerge over the next few months.

When it comes to pricing, wireless data networks are too expensive for today's typical mobile user, but monthly costs will go down dramatically as users are added. I believe that by the end of 1998 we will be able to connect our Windows CE device to our own information inexpensively from

PRODUCT REVIEWS

Pen/Stylus Combinations

Described here are the pen/stylus combinations I've been able to find so far. There are more out there and as I discover them, I'll list them in the H/PC Products section. The pen/styluses listed come from two major pen companies (Cross and Pilot) and a smaller company called Autopoint. I'll review these devices alphabetically.

Autopoint Stylus+

Autopoint Stylus+ — \$24.95

Stylus+ is a combination fine point ballpoint pen, 0.5mm pencil and stylus. You rotate the barrel of the device until the desired writing point indicator (on the top of the barrel) is facing you, and depress the top push button. The point retracts into the barrel with a touch of the pocket clip button. Stylus, ink cartridge and 0.5mm leads (2-3/8") are all replaceable. The Stylus+ is a little thicker than a standard pencil and is relatively light weight.



I tend not to read instructions — especially for pens. It took me a little while to figure out why there was only one button to press for three different tips. But after I did, it's quite easy to use. If you find the wrong tip coming out, you're probably holding Stylus+ straight up and down. Tilt it a little. The ballpoint tip was fine—point black ink, but you probably can get different color cartridge. Pull the plastic cap off the top button and you have a (very) small eraser for the pencil.

Stylus+: available directly from Autopoint at 608-757-0021; Fax: 608-757-0054; Email: autopt@jvl.net.com. Also available from Pygmy Computing Systems; Phone: 800-447-9469 or 305-253-1212; Fax: 305-255-1876; Web: www.pygmy.com

A Stylus is a Stylus (...or is it?)

Rich Hall

It comes with the H/PC and Palm PC. You pull it out, tap on the screen, and put it away. With all the good H/PC and Palm PC products available, why review a stylus? What's the big deal?

That's the way I used to think. Then I went to the Consumer Electronics Show and Bev Scott with Novatel Wireless gave me a complementary combination pen/stylus. It was a nice-looking black device with brass trim. Twist the barrel one way and a ballpoint pen comes out; twist it the other way and a small, black stylus point emerges. I slipped it in my pocket and went on my way. What was interesting was that I found myself using it over and over again, at CES and here at work.

I can easily slip the stylus out of my H/PC, but I found myself reaching for the pocket pen/stylus. I even found myself using it when I need to write a real, old-fashion note on a piece of paper. I'm not sure why I use it. Maybe it's because I've pulled pens out of my shirt pocket for years and I'm programmed to do it. Maybe it's because I find myself fumbling with the lightweight styluses that come with the H/PCs. Whatever the reason, of all the products I saw at CES, guess which one I have used every day? That's right — the pen/stylus!

This review will only look at pen/stylus combinations — a single device with both a stylus and pen, and two examples of three-way pen/stylus/pencil combinations. Cross and Pilot also sell attractive stylus-only devices that look like a pen and clip in your shirt pocket. If you are interested in these, you can contact them (contact information below). If you are interested in a replacement stylus for your H/PC or Palm PC (i.e., one that fits in the devices' stylus slot) contact the manufacturer directly (see "At A Glance," page 56).

Cross DigitalWriter Duo

Cross DigitalWriter Duo — \$34.95

A dual-function device with a ballpoint on one end and a stylus on the other. Remove the cap and place it on the stylus end to use the ball-point pen. The barrel of the Duo is available in blue, black, and burgundy. The DigitalWriter Duo comes with a "polymeric stylus tip for a 'pen-on-paper' feel." The cap of the pen has a pocket clip. Cross Pen Computing Group also offers stylus-only devices in classic Cross Pen styles.



This is a nice looking pen/stylus. The sample I got was black with brass tip and clip. The cap with the clip slips over the ballpoint end and screws in place, leaving the stylus end permanently exposed. The barrel of the DigitalWriter Duo is slightly thicker than the Stylus+. I preferred the thickness and heft of the DigitalWriter Duo, but that is a personal preference not everyone shares. I have mixed feelings about the screw-on cap. It's a simpler solution than the push-button approach and less likely to break down. It's very easy to pull out of your pocket and use the stylus — it's always exposed. But it's not as easy to pull out of your pocket, click and write with the pen.

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DigitalWriter Duo is available from Cross Pen Computing Group; Phone: 800-510-9660 / 401-333-1200; Fax: 401-334-0650; Web: www.crosspcg.com.

Pilot Pentopia

Pilot had five pen/stylus combinations available, in varying styles and price.

Pentopia T3240

Pilot Pentopia T3240

— \$39.95

Like the Cross pen, this slim combo comes with a pen on one end and stylus on the other. You pop the cap off one end, to expose the desired tip and pop it on the other.

This is the classiest of the slim combos I looked at. It's also the most expensive. The pencil-thin metal body is dark blue

enamel with brass trim. The sample I tested had a black fine-point pen cartridge. As with other pens I looked at, the cartridges looked standard and probably come in different colors and tip sizes.



Replacement Styluses

from H/PC and Palm PC manufacturers

This review was for people who like having a nice looking and/or functional pen in their pockets. If you are happy with a BIC or some other throwaway pen, then one of these stylus/pen combinations is probably overkill for you.

However, whoever you are, you will probably be in the market for a replacement stylus sometime in the future. This is because YOU WILL LOSE the stylus that came with your H/PC! The ones that come with the H/PCs and Palm PCs are so small and light, that they are very easy to misplace. Here is some advice that may help:

How to not lose your stylus

1. Never lay it down on a table or desk! If you need to use it, pull it out, use it, and put it back in the H/PC or Palm PC immediately! As soon as it goes down on a table, it's out of your mind. If you get in the habit of doing this, you will eventually forget it and lose it!

2. Don't keep it in your hand too long! Pull it out, use it, and put it back. Even if you think you'll need it again in a few minutes, put it back! The longer it's out, in your hand, the greater the chances it will be lost.

3. Never loan it to anyone. It's part of your H/PC. You wouldn't loan them your screen or

keyboard or even your batteries. Don't loan them your stylus. If it's out of your hand and not in the stylus slot of the H/PC, you'll lose it.

4. When in doubt, put it back in its slot. Get in the habit! Stay in the habit!

What to do after you lose it

All this said, when you do lose your stylus, you'll need a replacement that fits in the slot of your H/PC or Palm PC. The pen/stylus devices in this review, nice as they are, do not fit in the slot of your H/PC. Contact the manufacturer of the Windows CE device for a replacement (usually sold in packs of three). See the "At a Glance" section beginning on page 56 for contact information.

Pentopia T2300



Pilot Pentopia T2300 "two plus one" —\$29.95

The T2300 is a light-weight metal device with three sliding levers at the top to select the desired function (pen, 0.5mm pencil, or stylus). The exposed pen/stylus/pencil tip automatically retracts when you click another lever.

The T2300 is slimmer than the Cross, but ample enough for those preferring the feel of thick pens. The T2300 is very easy to pull out of your pocket, click, and use. It's easy to identify the red sliding lever of the stylus. The sample I looked at came with a fine point black ballpoint cartridge, but it's a very standard looking refill that probably comes in many different colors. A cap on the top of the T2300 unscrews to expose the eraser — a little more substantial than the one on the Stylus+, but you'll still need refills. Don't forget to screw the cap back on.

Pentopia T3220



Pilot Pentopia T3220 — \$14.95

Another dual—function device with a ballpoint on one end and stylus on the other. Remove the cap and place it on the stylus end to reveal the ball—point pen. Color: Black/silver accents; Dimensions: 5 1/8" long x

3/8" in diameter; Ballpoint Pen Refill #: BRFS2 BLK F 6PK (black, fine point)

Shorter and just a little thicker than a pencil, the T3220 has a hard rubber stylus tip that leaves marks on paper, but not on the H/PC screens I tested. About the size of the first Pentopia, but less than half the price.

Pentopia T3200



Pilot Pentopia T3200 — \$ 7.95

A slim stylus/pen combination with ballpoint on one end and stylus on the other. Remove the cap and place it on the stylus end to reveal the ball point pen. Color: Gun-metal gray/black accents; Dimensions: 4 3/4" long x 1/4" in diameter; Ballpoint Pen Refill #: BT8-BLKF

(black, fine point)

The T3200 is about half the thickness of a pencil and thinner than most of the styluses that came with the H/PCs. This one if for people who like really slim pens. Because of its size, I don't think I'd use it as my main pen/stylus. But it's small enough to fit in the back of my wallet and have ready as a spare.

Pentopia T2200



Pilot Pentopia T2200 — \$10.95

Twin-point retractable combination pen/stylus with an oversized barrel for a comfortable grip. Switch from writing with the pen to writing with the stylus by sliding down the color-coded buttons located on either side of the pocket clip. Color: Black/white accents; Dimensions: 5 1/2"

long x 1/2" in diameter; Ballpoint Pen Refill #: RFT4-BLK F (black, fine point)

Another pen/stylus that I find comfortable to hold because of its oversized barrel. Two sliding buttons on the top of the barrel make it easy to switch from pen to stylus. This is an inexpensive plastic pen that works.

Which pen/stylus combo to buy?

It all depends on what kind of person you are. If you like the look and feel of a fine pen, go for the Cross DigitalWriter Duo and the Pilot Pentopia T3240. If you pride yourself on being functional, the Autopoint Stylus+ and the Pentopia T2300 "two plus one" may be for you. If you've got more important things to do then think about pens, you may go for some of the less expensive Pentopias.

Of course, most of us are a mixture of these tendencies. No recommendations, just some general advice. First, make sure you have the stylus out and not the pen when you write on the H/PC — the metal ball can damage the screen. Second, if you get one of the combos with a pencil, get some extra erasers. Third, if you've lost your stylus and just have a BIC pen, the plastic clip on the cap makes a decent emergency stylus.

ListPro

ListPro keeps track of your lists... and your life

By Dan Beggs

I make lists all the time; what to do this weekend, what to bring on vacation, what we need at the store. Like many people, I am always updating the lists (and making them harder to read) or losing the piece of paper they were written on. Some lists are fairly static and re-used often, but I haven't found a good place to keep them so I can find them again. The folks at Ilium Software have solved all these problems with their latest software for Windows CE handheld PCs — ListPro™.

ListPro lets you build your own lists from scratch, or edit the ones that come with the program. You can create simple lists, shopping lists, recurring tasks lists, and more. You can add categories and notes to the items in your list, and number your list items for step-by-step instructions.

Imagine making a grocery list that



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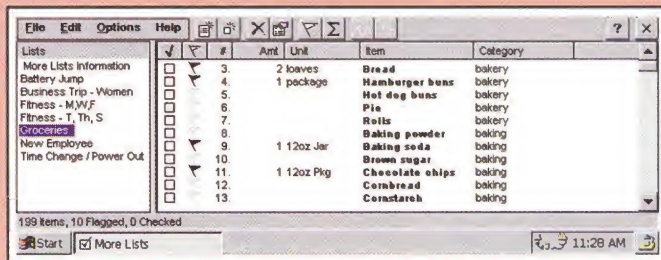
includes every item you might purchase, including those you need only once a year. For each item there is a 'category' field so you can create groups by their location in the store or some other criteria. There is an 'amount' field, allowing you to indicate how many of a given item you need. And then there is the 'flag' field that lets you mark each item needed on this trip to the store (see Screen 1). When the desired items are flagged, an action button pares the list down to what you need for this trip. And as the check box next to each item is marked off in the store (see Screen 2), the item disappears from the screen — only the items left to be purchased are shown. The flag and check box fields can be cleared, and the list reused an endless number of times. This is the kind of list you can create with ListPro.

ListPro also lets you create numbered lists, where tasks must be performed in a certain order. A status display bar (lower left of screen, above Start button) shows how many items are in your list, how many are flagged and how many are yet to be done (see Screen 3). You can sort your lists by item name or category and a notes field provides space for additional information on any item in the list. A new list can be entered from your handheld PC, or created on a desktop PC as a flat file and then imported into ListPro.

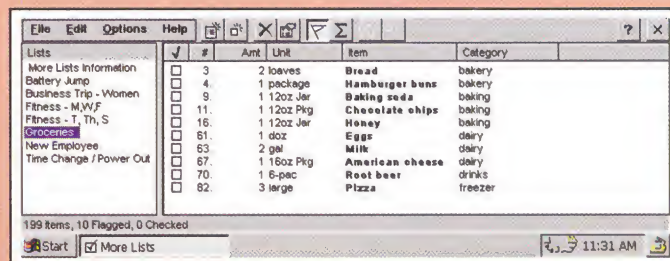
Creating and keeping lists are great ways to save time and keep track of things you've learned the hard way. You can use ListPro to create lists about daily jobs, videos to rent, borrowed items, things to pack, office supplies, favorite restaurants, groceries needed, errands to do, clocks to change, interview questions, exercise tracking, event planning, people to keep after, books to read, gift lists and ideas, and much more.

If you consider yourself a list maker, or wish that you were, ListPro helps keep your lists organized and safe. ListPro comes with a number of sample lists, including a packing list for a business trip, clocks to be reset when the time changes, movies available to rent, a grocery list (with 199 items already entered) and the steps to use in jump-starting your car. These sample lists will inspire you and give you practical ideas on how to use lists and ListPro. ■

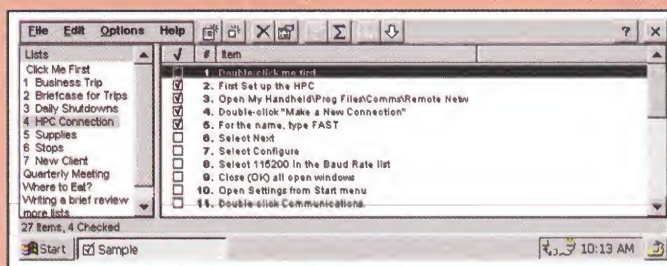
ListPro is priced at \$24.95 and is available from Ilium software. Phone: 888-632-5388 or 313-973-9388; Fax: 313-973-2640; Email: order@iliumsoft.com; You can download a 30-day trial version of ListPro at www.iliumsoft.com; While you're there, check out their other Windows CE programs.



Screen 1: ListPro lets you create simple checklists, like this grocery list. You can keep a comprehensive list of all the items you buy, even if you only buy them once a year.



Screen 2: A large list can be unwieldy, like the comprehensive grocery list above. You can have ListPro display only those items you need for this trip (i.e., the items you've flagged). When you put the item in your shopping cart, tap the check box and the item disappears from the display, leaving only those items you still need.



Screen 3: ListPro lets you create a numbered step-by-step list. This one shows the steps involved connecting an H/PC to an Internet Service Provider via modem. Note the Status Display Bar in the lower left above the Start button. It displays the number of items in the list and the number completed and checked.

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PC Companions At A Glance

Handheld PCs

CASIO

CONTACT your local Casio dealer or Casio, Inc.; Phone (USA): 201-361-5400; Fax: 201-361-3819; Web: www.casio-hpc.com



Casio CASSIOPEIA A-20 — \$599.95

HARDWARE: 80 MHz Hitachi SH-3 CPU; 8 MB RAM; 640 x 240 backlit display with 4 shades of gray; QWERTY keyboard, serial port, IrDA infrared port; Type II PC Card slot; CompactFlash Card slot; built-in microphone and speaker; two AA Alkaline batteries; backup battery; AC adapter; user guides; CD ROM with sample software.

BUILT-IN SOFTWARE: Microsoft Windows CE 2.0 operating system, accessories and "Pocket" applications. Software on disk or CD ROM: QuickNotes; pcANYWHERE CD; E-Mail Access; Financial Consultant Calculator; bFAX Pro; IntelliSync; Socket Connectivity product; PageSoft Pro; GTE Personal Sender; Tetris; Casio QV-Link; Casio Project Scheduler; Casio Paint-Atlas; Casio Sound-Vega voice memo; Casio Voice Applications voice command; Casio Teleconferencing Software; Casio Easy File Tool; Financial Consultant Calculator;

ACCESSORIES: PC Docking Cradle; AC adapter; Rechargeable Battery Pack; Windows CE 2.0 upgrade kit for CASSIOPEIA A-11 and A-11+.

COMPAQ

CONTACT your local Compaq dealer or Compaq DirectPlus; Phone (USA): 800-888-0593; Web: www.compaq.com



Compaq C-Series — \$To be announced

HARDWARE: 75MHz MIPS RISC CPU, 16MB ROM, 8MB or 16MB RAM (expandable to 20 or 32 MB), 640 x 240 mono or color touch sensitive screen; integrated 33.6 modem (optional in some countries); Type II PC Card slot; powered by two Alkaline AA batteries or NiMH rechargeable battery pack (optional on some models) or A/C adapter (included); serial cable; user guides; CD ROM with sample software.

BUILT-IN SOFTWARE: Microsoft Windows CE 2.0 operating system, accessories and "Pocket" applications. Software on disk or CD ROM: not announced.

ACCESSORIES: Windows CE 2.0 Upgrade Kit for PC companion C120, C120+, and C140; Battery pack; Cradle; Auto sync Cable; Stylus 3-Pack; 16MB Ram Expansion; Auto Adapter; Carrying Case; Slip Case; Portfolio Case; AC Adapter; VGA PC Card; Compaq Mobile Internet Antenna.

ERICSSON

CONTACT: Ericsson Mobile Communications; Web: mobile.ericsson.se



Ericsson Mobile Communications MC 12 — \$ TBA

Ericsson Mobile Communications' MC 12 works immediately with an Ericsson mobile phone. Its built-in software modem is easy on battery life and lets the user communicate wirelessly. Synchronize your MC 12" Contacts list with the phone book of your Ericsson phone.

HEWLETT-PACKARD

CONTACT your local HP dealer or Hewlett-Packard Company; Phone (USA): 800-443-1254; Web: www.hp.com/handheld



HP 620LX Palmtop PC — \$899

HARDWARE: 75 MHz CPU; 16 MB RAM; 640x240-pixel 256 color screen with "natural white" backlight-

ing; QWERTY keyboard; serial port; IrDA infrared port; Type II PC Card slot; CompactFlash Card slot; Lithium-Ion rechargeable battery pack; 3V CR2032 coin cell backup battery; microphone and audio speaker; synchronization cable; docking cradle; AC adapter; user guides; CD ROM with sample software.

BUILT-IN SOFTWARE: Microsoft Windows CE 2.0 operating system, accessories and "Pocket" applications; bFAX; bFIND; Financial software; Remote Networking and Terminal Application software; Calendar viewing utilities. Software on disk or CD ROM: H/PC Explorer version 2.0; Translation software to convert HP 100/200LX & OmniGo 100/120 appointment/ phone books to H/PC formats; Trial software from independent software vendors.

ACCESSORIES: HP CompactFlash Memory plus PC Card slot adapter: 2 MB - \$99, 4 MB - \$149, 10 MB - \$299, 15 MB - \$ N.A.; Worldwide AC Adapter for 620LX - \$ 34.99; DockingCradle/AC Adapter for 620LX - \$n.a.; Sync. Cable - \$14.99; HP Leather Case - \$69; Stylus 3-Pack for 620LX - \$N.A.; 620LX standard battery pack - \$69; 620LX Extended battery pack - \$119; 620LX VGA PC Card adapter - \$119; 620LX External Battery Pack Charger - \$N.A.



HP 360LX Palmtop PC — \$599

HARDWARE: 60 MHz CPU; 8 MB RAM; 640x240 monochrome screen with "natural-white" backlighting; QWERTY keyboard; serial port; IrDA infrared port; Type II PC Card slot; CompactFlash Card; 3V CR2032 coin cell backup battery; user guides; CD ROM with sample software.

BUILT-IN SOFTWARE: Microsoft Windows CE 2.0 operating system, accessories and "Pocket" applications; bFAX; bFIND; Financial software; Remote Networking and Terminal Application software; Calendar viewing utilities. Software on disk or CD ROM: H/PC Explorer version 2.0; Translation software to convert HP 100/200LX & OmniGo 100/120 appointment/ phone books to H/PC formats; Trial software from independent software vendors.

ACCESSORIES: HP CompactFlash Memory plus PC Card slot adapter (see 620LX accessories); 300-360LX AC Adapter - \$29.99; 300-360LX HP Docking Cradle/AC Adapter - \$29.99; Synchronization Cable - \$14.99; HP Leather Case - \$69; 300-360LX stylus 3-Pack - \$9.99



HP 320LX Palmtop PC — \$499

HARDWARE: 44 MHz CPU; 4 MB RAM; 640x240 monochrome backlit display; Type II PC Card slot; Compact Flash card slot; IrDA infrared port, synchronization cable; AC adapter; docking cradle; user guides. The 320LX will print directly from Pocket Word and the PIMs, via both IR and RS-232C ports.

BUILT-IN SOFTWARE: Microsoft Windows CE 1.1 operating system and "Pocket" applications. Software on disk or CD ROM: Synchronization software; Microsoft Schedule+ 7.0, trial versions of several Windows CE applications; H/PC Explorer version 1.1; HP 100/200LX & HP OmniGo 100/120 translation software; bFAX Pro; Mail on the run!; Pocket On-Schedule; Wireless solutions bundle from ARDIS; Wyndmail/CE

ACCESSORIES: (see 360LX accessories)

HITACHI

CONTACT your local Hitachi dealer or Hitachi Home Electronics; Phone (USA): 770-279-5600 or 770-279-5696; Web: www.hitachi.com



Hitachi Handheld PC — \$To be announced

HARDWARE: 80 MHz SuperH RISC-Hitachi CPU; 8 MB RAM; 640x240-pixel backlit monochrome display; internal modem; QWERTY keyboard; serial port; IrDA infrared port; Type II PC Card slot; Compact Flash slot; NiMH battery pack (included) or AA alkaline batteries; AC adapter; user guides; CD ROM with sample software.

BUILT-IN SOFTWARE: Microsoft Windows CE 2.0 operating system, accessories and "Pocket" applications. Software on disk or CD ROM: not announced.

ACCESSORIES: AC Adapter; Serial Cable; 28.8 bps Modem Board; Cradle with IrDA, VGA, Serial and AC adapter charger interfaces.

LG ELECTRONICS

CONTACT your local LGE dealer or LG Electronics Customer Information Center; Phone (USA): 800-243-0000; Web: www.lge.co.kr

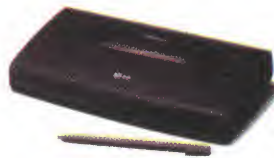


LG Phenom Ultra — less than \$1,000

HARDWARE: 100MHz Hitachi SH3 CPU; 16MB RAM; 640x240-pixel backlit 256-color VGA display (8.4" diagonal screen); internal 28.8Kbps modem; "large" QWERTY keyboard; VGA-out port; serial port; IrDA infrared port, Type II PC Card slot; CompactFlash slot; voice memo capability; rechargeable Lithium-ion battery pack (10 hours of battery life, according to LGE).

BUILT-IN SOFTWARE: Microsoft Windows CE 2.0 operating system, accessories and "Pocket" applications. Software on disk or CD ROM: Windows CE Services, third-party software to be announced.

ACCESSORIES: To be announced.



LG Phenom — \$599

HARDWARE: 80 MHz SuperH RISC-Hitachi CPU; 8 MB RAM; 640x240-pixel backlit monochrome display; internal fax/modem; QWERTY keyboard; VGA out port with cable; serial port; IrDA infrared port; Type II PC Card slot; Compact Flash slot; voice memo capability; rechargeable battery pack; docking station; power adapter; user guides; CD ROM with third party software applications.

BUILT-IN SOFTWARE: Microsoft Windows CE 2.0 operating system, accessories and "Pocket" applications. Software on disk or CD ROM: not announced.

ACCESSORIES: LG Windows CE 2.0 upgrade.

NEC

CONTACT your local NEC dealer or NEC; Phone (USA): 800-632-4636; Web: www.nec.com



NEC MobilePro 700 — \$To be announced

HARDWARE: 54 MHz low power NEC MIPS VR4102 CPU; 8 MB of RAM (expandable to 32 MB); Dimensions (9.65 x 4.8 x 1.22 inches); Weight (1.48 lbs); QWERTY keyboard; 640x240 backlit monochrome display; built-in 33.6Kbps low-power hardware modem; two AA alkaline batteries; one Type II PC Card slot, one Compact Flash slot, a VGA port with cable adapter; serial and IrDA infrared ports; built-in microphone and speaker for voice recording capability; QuickKeys (program keys to launch applications); AC adapter, PC cable, RJ-11 cable, batteries; user guides; CD ROM with sample software.

BUILT-IN SOFTWARE: Microsoft Windows CE 2.0 operating system, accessories and "Pocket" applica-

tions. Software on disk or CD ROM: Virtual Courier; pcANYWHERE; Intellisynch; bFAX; QuickNotes; Sprynet.

ACCESSORIES: 16 MB Memory Upgrade; 32MB Memory Upgrade; Compact Flash Card; Docking Cradle; Serial Cable; VGA Cable; Rechargeable Battery Pack; Battery Quick Charger (Battery included); AC Adapter; Modem Cable; Stylus Pak (3-pens); Carrying Case. Windows CE 2.0 Upgrade kit for MobilePro 450 & 500.

NOVATEL WIRELESS

CONTACT Novatel Wireless; Phone (USA): 888-888-9231; Web: www.novatelwireless.com



Novatel CONTACT — \$To be announced

HARDWARE: MHz Hitachi SH3 RISC CPU; 4 MB RAM (expandable to 32 MB); 640 by 240 backlit touch screen, an integrated 19.2 Kbps CDPD wireless modem (uses existing U.S. Cellular telephone networks) and a 14.4 Kbps landline modem; LEDs (e-mail and multi-function indicator); IrDA infrared port; Serial/VGA port; Type II PC Card slot; RJ-11 modem jack; microphone and speaker; QWERTY keyboard; Lithium Ion rechargeable battery; Lithium coin cell backup battery; AC adapter; user guides; CD ROM with sample software.

BUILT-IN SOFTWARE: Microsoft Windows CE 2.0 operating system, accessories and "Pocket" applications. Software on disk or CD ROM: not announced.

ACCESSORIES: (All items included in the original package can be purchased as accessories); Serial/VGA cable; Leather Case; Cradle; DC Car Adapter.

PHILIPS

CONTACT: Philips Mobile Computing Group; Phone (USA): 888-FOR-VELO; 408-558-2200; Fax: 408-558-2222; Web: www.velo1.com. U.S. retail outlets include: CDW, CompUSA Direct; Mobile Planet, PC Connect, and PC Zone.



Philips Velo 500 with 16 MB RAM — \$699

Philips Velo 500 with 24 MB RAM — \$799

Philips Velo 1 with 4 MB RAM — \$399

Philips Velo 1 with 8 MB RAM — \$549

HARDWARE: 75 MHz MIPS processor; 16 MB or 24

At A Glance

MB of internal RAM (expandable to 40 MB or 48 MB with an optional 32 MB DRAM Miniature Card); built-in low power 28.8 Kbps modem with 9600 Kbps fax; DRAM Miniature Card slot; Flash/ROM Miniature Card slot; 16 level grayscale monochrome screen capable of 480x240 or 640x240 pixel display; Velo Voice Memo system; built-in phone jack; phone cord; rechargeable NiMH battery pack; and docking station, connectivity cable, 9-to-25-pin adapter, AC Adapter.

BUILT-IN SOFTWARE: Microsoft Windows CE 2.0 operating system, accessories and "Pocket" applications. Software on disk or CD ROM: not announced.

ACCESSORIES: Velo 1 upgrade to Windows CE 2.0; 2 MB DRAM Card; 4 MB DRAM Card; 2 MB Flash Miniature Card; 4 MB Flash Miniature Card; Velo Docking Station; Velo Type II PC Card V-Module; Velo-to-PC Serial Cable; NiMH Rechargeable Battery Pack; Traveling AC Adapter; Carrying Case.

SHARP

CONTACT your local Sharp dealer or Sharp Electronics Corporation; Phone (USA): 800-BE-SHARP; Fax on demand: 630-397-8601; Web: www.sharp-usa.com



Sharp Mobilon HC-4500
(color display, 16 MB RAM) — \$999

Sharp Mobilon HC-4000/4100
(color display, 4/8 MB RAM) — \$600-900 (est.)

HARDWARE: 73.7 MHz MIPS CPU; 4, 8, or 16 MB RAM; built-in 33.6Kbps data/9.6Kbps fax lower power modem. The HC-4000 and 4100 have a 16-gray scale monochrome touch-screen display; HC-4500 has a 256 color touch screen display. All Mobilons have a Type II PC Card slot; serial port; IrDA infrared port; 64-key keyboard; one-touch application launch keys; LED indicators (Calendar and Task reminders, World Clock daily alarms, when it's time to charge the batteries, when your modem is connected, and when you are recording a voice memo); built-in microphone and speaker (to record voice memos); external record button; AC adapter, CR2032 Lithium backup battery; PC Link serial cable; RJ-11 modular phone cable; stylus. The 4500 comes with a NiMH rechargeable battery pack as a standard feature. The 4000/4100 comes with AA alkalines, but users can purchase the rechargeable battery pack as an option.

BUILT-IN SOFTWARE: Microsoft Windows CE 2.0 operating system, accessories and "Pocket" applications. Software on disk or CD ROM: bFAX Express; Voice Recorder; Image Editor; Sharp Zaurus Data Transfer; Microsoft Windows CE Services; IntelliMigrate; Microsoft Schedule+ 7.0a.

ACCESSORIES: Docking Station Kit (includes

docking station, NiMH rechargeable battery pack, AC adapter); NiMH Rechargeable Battery Pack; Digital Camera Card.

Palm PC

CASIO

CONTACT your local Casio dealer or Casio, Inc.; Phone (USA): 888-204-7765 or 973-361-5400; Web site: www.casio.com



Cassiopeia E-10 Palm PC -- \$399

HARDWARE: 100 MHz NEC VR4111 RISC processor; 4MB RAM; 8MB ROM; 320x240 touch-sensitive backlit display; CompactFlash slot; serial port, IrDA port, built-in voice record/playback capability. Weighs 5.5 oz (171 g); size 3.2 x 4.9 x .72 inches (8.13 x 12.45 x 1.83 cm), powered by 2 AAA batteries and a CR2016 backup battery. Comes with connectivity cradle, carrying case, manuals, and additional software.

BUILT-IN SOFTWARE: Microsoft Windows CE 2.0 operating system, accessories, and "Pocket" applications, including Pocket Outlook, Inbox, Mobile Channels and Notetaker. Software on disk or CD ROM: Microsoft Windows CE Services with ActiveSync.

ACCESSORIES: Connectivity cradle, carrying case, AC adapter, modem adapter; CompactFlash storage card.

EVEREX

CONTACT Everex Systems; Phone (USA): 800-EVEREX1; Web: www.everex.com.



Freestyle Associate and Executive Palm PCs — \$399/\$499

HARDWARE: 54 MHz NEC VR 4102 MIPS RISC processor; 4MB (Associate) or 8MB (Executive) RAM; 8MB ROM; 320x240 touch-sensitive backlit display; CompactFlash slot; serial port, IrDA port, built-in voice record/playback capability. Weighs 5.29 oz (150 g) size

4.8 x 3.18 x .64 inches (12.2 x 8.1 x 1.7 cm), powered for up to 20 hours by 2 AAA batteries and a CR2032 backup battery. Comes with connectivity cradle, AC adapter, manuals, and additional software.

BUILT-IN SOFTWARE: Microsoft Windows CE 2.0 operating system, accessories, and "Pocket" applications, including Pocket Outlook, Inbox, Mobile Channels and Notetaker. Software on disk or CD ROM: Microsoft Windows CE Services with ActiveSync; bFAX Express, bTrack, smARTwriter & smARTcommand, JOT.

ACCESSORIES: Docking station with integrated 33.6k modem; NiMH rechargeable battery; wireless paging card.

LG ELECTRONICS

CONTACT local LG dealer or LG Electronics Customer Information Center; Phone (USA): 800-243-0000; Web: www.lge.co.kr

LGE Pocket Phenom - \$To be announced

HARDWARE: SH3 processor; 320x240 touch-sensitive backlit display; CompactFlash slot; serial port, IrDA port, built-in voice record/playback capability. Powered by 2 AAA batteries, backup battery. Weight, size, and other details not yet available.

BUILT-IN SOFTWARE: Microsoft Windows CE 2.0 operating system, accessories, and "Pocket" applications, including Pocket Outlook, Inbox, Mobile Channels and Notetaker. Software on disk or CD ROM: Microsoft Windows CE Services with ActiveSync.

ACCESSORIES: Information not yet available.

PALMEX

CONTACT Palmex; Phone (in Taiwan): +886-2-2266007; Email: palmex@palmex.com.tw; Web: www.palmex.com.tw



Palmex PD-300 Palm PC — \$299

HARDWARE: 60 MHz SH3 processor; 2 MB RAM (expandable to 4 or 10 MB); 8MB ROM; 320x240 touch-sensitive backlit display; CompactFlash slot; serial port, IrDA port, built-in voice record/playback capability. Weighs 6.5 oz (184 g) size 4.9 x 3.2 x .8 inches (12.45 x 8.13 x 2.03 cm), powered by 2 AAA batteries and a CR1220 backup battery. Comes with connectivity cradle, AC adapter, manuals, and additional software.

BUILT-IN SOFTWARE: Microsoft Windows CE 2.0 operating system, accessories, and "Pocket" applications, including Pocket Outlook, Inbox, Mobile Channels and Notetaker. Software on disk or CD ROM: Microsoft Windows CE Services with ActiveSync

ACCESSORIES: NiMH rechargeable battery pack.

PHILIPS ELECTRONICS

CONTACT Philips Mobile Computing Group; Phone (USA): 888-367-8356 or 408-558-2200; Fax: 408-558-2222; Web: www.mobile.philips.com (then go to Nino Store).



Philips Nino 301 and 302 Palm PC -- \$399.99/\$499.99

HARDWARE: 75 MHz MIPS R3900 processor; 4MB or 8MB RAM; 8MB ROM; 320x240 touch-sensitive backlit display with control dial; built-in low power 22.8 Kbps modem; CompactFlash slot; serial port, IrDA port, built-in voice record/playback capability. Weighs 7.33 oz (227 g); size 3.41 x 5.25 x .8 inches (8.66 x 13.34 x 2.03 cm). Four quick start buttons launch the most commonly used applications. The 301 is powered by 2 AA batteries and a CR2025 backup battery and comes with NinoDock connectivity cradle, carrying case, manuals, and additional software. In addition to the above, the Nino 302 also comes with a NiMB rechargeable battery. Either model can use the battery pack or AA batteries.

BUILT-IN SOFTWARE: Microsoft Windows CE 2.0 operating system, accessories, and "Pocket" applica-

tions, including Pocket Outlook, Inbox, Mobile Channels and Notetaker. Software on disk or CD ROM: Microsoft Windows CE Services with ActiveSync; T9 -- a utility that facilitates data entry by predicting words and character strings you enter; smARTwriter handwriting recognition software, and voice command recognition software. The package will also come with Nino-specific applications, which will be announced later.

ACCESSORIES: Modem, NiMB rechargeable battery pack.

SAMSUNG

CONTACT your local Samsung dealer or Samsung Electronics America, Phone (USA): 201-229-4000; Fax: 201-229-4019; Web: www.sosimple.com



Samsung Palm PC — STBA

HARDWARE: 75MHz NEC MIPS processor; 2MB

RAM (expandable to 8 MB) and 4 MB ROM (expandable to 8 MB); 240x340 touch-sensitive backlit display; built-in 28.8 modem; CompactFlash slot; serial port; IrDA port; built-in voice record/playback capability. Weighs 3.88 oz (110 g) (plus weight of batteries); size: 3.35 x 5.12 x .78 inches (8.51 x 13 x 1.98 cm); powered by 2 AA batteries; backup battery. Comes with Connectivity cradle, AC adapter, user manuals.

BUILT-IN SOFTWARE: Microsoft Windows CE 2.0 operating system, accessories, and Pocket applications, including Pocket Outlook, Inbox, Mobile Channels and Notetaker. Software on disk or CD ROM: Microsoft Windows CE Services with ActiveSync

ACCESSORIES: No information at this time.

UNIDEN

CONTACT -- no information at this time

Uniden Palm PC — \$To be announced

Uniden plans to introduce a Palm PC later on this year, but has released no details.

Auto PC

CLARION

CONTACT your Clarion dealer or Clarion Sales Corporation; Phone (USA): 310-327-1999; Fax: 310-327-1999; Web: www.autopc.com or www.clarionmulti-media.com



Clarion Auto PC — \$1,299

HARDWARE: 60 MHz Hitachi SH3 processor; 8 MB RAM; 8 MB ROM; 8-color, 256 x 64 pixel active magrix LCD display with detachable face plate; microphone; CompactFlash slot; IrDA infrared port; serial port; 1-DIN form factor fits in standard dashboard slot; AM/FM stereo tuner; 35 watt x 4 channel; 4 pre-amp outputs; CD/CD-ROM player; Digital Sound Processor (DSP); Universal Serial Bus (USB).

BUILT-IN SOFTWARE: Windows CE 2.0 operating system with voice-activate control; voice memo, address book, highway navigation, vehicle mileage log, text-to-speech messages.

ACCESSORIES: CompactFlash memory card; InfoGation AutoPC file manager; Clarion GPS receiver; map data for Global Positioning System; Clarion USB 6 CD/CD-ROM auto changer; UNGO USB vehicle security system; cellular telephone/modem USB interface, FM side-band wireless receiver & services, ASSIST services, vehicle diagnostic/monitoring interface.



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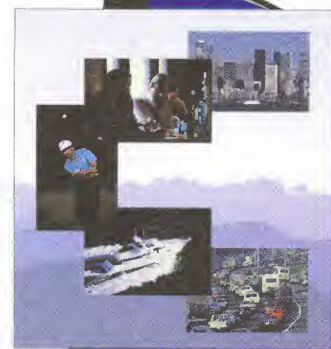
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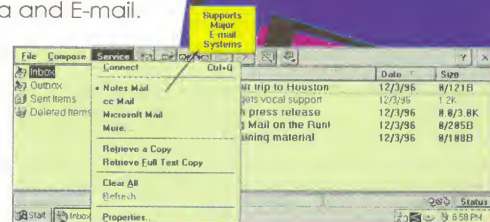
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